

COMPUTERWORLD

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Wide World Photos

Space Shuttle Lags May Delay Satellite Use

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — Continuing delays in launching the space shuttle are increasing costs for U.S. satellite communications carriers and may delay provision of the related services, carriers said last week.

Although alternate launch facilities are available, Philip Schneider, vice-president for satellite systems at Western Union Telegraph Co., said the delay in the shuttle program will make it more difficult to meet customer requirements.

The present shortage of satellite channels — most satellite communications carriers are putting new service orders on waiting lists — will ease somewhat within the next few years as additional satellites are launched by Western Union and others, Schneider explained.

But, by about 1984, new applications are expected to create another crunch, he said. This will be caused primarily by rapidly growing needs for satellite channels to handle data collection and distribution and cable and broadcast TV applications. Schneider said he is "unsure" how long the shortage will continue after 1984.

First Flight

Originally planned for March 1979, the first flight of the shuttle has been delayed repeatedly. The latest slippage — from November 1980 to February or March of 1981 — was announced early this year by the National Aeronautics and Space Administration (Nasa), which is in charge of developing, launching and operating the shuttle.

Last week, a Nasa spokesman said a further delay of up to 11 weeks is under consideration. He expects a decision to be announced by the end of this month.

Even assuming the present schedule holds, it will be September 1982 before the first communications satellite is sent aloft aboard the shuttle. There will be four flights preceding this launch, but all will be devoted to testing the shuttle and its complex supporting systems.

The September 1982 flight will carry a tracking and data relay satellite (TDRS) to be used exclusively by Nasa. The following November, under the current schedule, Satellite Business Systems (SBS) will be the first carrier to launch a commercial satellite aboard the shuttle.

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Republicans Rally CPUs

• CBS System Tracks Details

By Marguerite Zientara
CW Staff

DETROIT — Amidst the hoopla that was the Republican Convention here last week, CBS News used its electronic wizardry to gather, process and disseminate data about convention goings-on to an army of reporters and millions of home viewers around the country.

Besides gathering and channeling relevant information to its own legion of reporters here at Joe Louis Arena, CBS also ran a computerized system for tallying delegate roll call votes, the results of which were transmitted electronically to all three major television networks.

With the roll call tallying system lying dormant except for the presidential

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• ABC Marks New Beginning

By Bruce Hoard
CW Staff

DETROIT — The Republicans were seeking a new beginning here last week, and so was ABC News.

For the Republicans, it was political unity; for ABC, it was the implementation of its electronic editorial system. That system, given the blessing of top brass, may develop into a computerized worldwide news-gathering network.

The system was used here to access a political data base filled with 2.4 million bytes of information gathered since the primaries began. After a typed command by a producer, ABC anchormen Frank Reynolds and Ted Koppel had only to watch their CRT terminals to obtain any information

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Address Feature Extends Options For 3033 Users

By Marcy Rosenberg
CW Staff

WHITE PLAINS, N.Y. — One of the newest carrots IBM is dangling before users of all versions of its 3033 CPU is the Extended Addressing feature, but only the 3033 multiprocessor (MP) version can take the full 32M bytes out of it.

One of several OS/VS2 MVS enhancements the firm recently announced [CW, June 16], Extended Addressing was described by IBM as an "architectural extension implemented in hardware and microcode" that will allow 3033 multiprocessors to directly address up to 32M bytes of information. This is double the previous capability for the maximum MP configuration consisting of two 16M-byte processors.

However, IBM is also making this

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Structured Methods: The Impossible Dream?

By Rita Shoor
CW Staff

AUGUSTA, Maine — Does increasing programmer productivity by 21%, training someone without programming experience to generate usable Cobol code in three to five weeks and meeting target completion dates for application systems 94% to 95% of the time sound like the impossible dream?

It's happening at the Central Maine Power Co. here, and much of the credit is attributed to structured techniques, according to Brian S. Callahan, a supervisor of technical support systems.

The switch to structured methodology began with intensive training for several staff members and was based essentially on the techniques gen-

erally associated with Edward Yourdon, head of Yourdon, Inc., Callahan said. Once this core group had been trained, audio/visual courses from Deltak, Inc. were provided for the rest of the staff.

This is the first in a series of articles describing users' experiences — both successful and not so successful — with structured methodology.

The following techniques are currently used by Central Maine's staff:

- Top-down design and testing.
- Structure charts with numbering conventions

to identify the chart level and special symbols for common modules. (Callahan specified that logic flow switches rather than data flow are illustrated on these charts.)

- Structured walkthroughs.
- Coding rules that include strict indentation for increased readability, the enforcement of a "no literals" requirement and GOTO-less coding structures.

A flexible attitude is essential, since not all structured techniques are appropriate for every organizational environment, he said.

The chief programmer team approach and hierarchical input-process-output (Hipo) charts were among the tools which Callahan's group de-

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Computer Gear Overtaxed

Data Lags Cited in Nuclear Mishap

By Brad Schultz
 CW Staff

LYNCHBURG, Va. — Computer equipment problems during the Three Mile Island nuclear mishap of last year mainly involved a two-and-a-half-hour lag time in generating output data on the overheating reactor plant's status.

So said a spokesman for Babcock & Wilcox, Inc. (B&W), which designed the ill-starred General Public Utilities Co. plant, in explaining how B&W has developed and begun to sell the Real Event Computer Acquisition List and Logger (Recall) to prevent that trouble from happening again.

In an interview last week, the spokesman gave *Computerworld* an insider's view of how overtaxed computer gear stymied early efforts to shut down the Three Mile Island plant, where a melting reactor core appeared ready to send an immense cloud of radioactive gas over the densely populated northeastern U.S.

The plant's main computer system, a special-purpose Bailey Meter Co. Model 855, "worked very well" at the time, according to Jim Brunke, manager of product management at B&W's Nuclear Power Generation Division here. But supposedly "real-time" printers fell hours behind in delivering urgently needed status data because computer data collection devices were too busy recording the information to be engaged in transmitting it.

Atom-driven power plants need data collection systems to monitor temperature, coolant-pipe pressure and other measures of whether safety parameters are being met, Brunke explained. Such information comes from analog sensor units, which send electric current to the data collectors at voltages that reflect degree of temperature, pressure

or some other physical condition, such as radioactivity.

Reactimeter Problems

At Three Mile Island, a B&W collection device called the Reactimeter was installed when, in March 1979, the nation's worst nuclear calamity began. Engineers at the plant on Pennsylvania's Susquehanna River found they could not "delog" the Reactimeter — use it to retrieve status data — without interrupting the unit's logging function — acquisition of the data.

The latter was also critical, Brunke pointed out, because only through the Reactimeter could reactor experts gather a continuous digital narrative of how the overheating process developed and thus get indications of how close the core was to the dreaded condition of uncontrollable meltdown.

Worse yet, the Reactimeter, which was designed about a decade prior to the incident, was swamped by the volume of alarm signals touched off as the overheating continued. Some information bearing on the situation was lost because the system did not have time to record it.

Its Replacement

As, in one B&W spokesman's words, an "outgrowth" of the Three Mile Island troubles, Recall will replace the Reactimeter, offering a capacity for recording 448 analog and 192 digital channels. The dedicated system is based on the Compudas microcomputers turned out by Ithaco, Inc. of Ithaca, N.Y.

According to Paul Nyman, Ithaco's marketing manager, each of the three Compudas micros that comprise Recall feature a Zilog, Inc. Z-80 microprocessor; 36K bytes of random-access memory, mostly user-programmable; and

an operating system in firmware.

With Recall, analog signals from sensors scattered about a nuclear power plant reach two of the system's Compudas microcomputers at the same time. Numerical values for such voltages are derived by the parallel Compudas micros and entered in memory as packets of five bytes per value. One of the micros, called a data handler, formats this data, adds checksums and other information intended to ensure integrity and transmits the data to Recall's third Compudas, which controls the I/O peripherals used by power plant technicians to retrieve the status readings.

After converting analog signals to digital packets, the second Compudas runs like the flight recorder on an airplane, Nyman continued. The same data multiplexed and routed over RS-232C lines to the I/O-controlling Compudas is stored by the second micro on cassette tapes.

And that is how B&W hopes to avert any recurrences of the Three Mile Island I/O dilemma, the company's Brunke observed. In an emergency, reactor experts could obtain a continuous flow of sensor readings sent from the data handling Compudas to the I/O-controlling Compudas, which would pass the news to graphics terminals and printers.

As for the problem of alarm signals swamping collection systems, Recall can monitor up to 3,300 analog point/sec, according to Brunke, which can mean monitoring of 3,300 sensors in one second or one sensor 3,300 times in one second.

B&W is aiming Recall at customers within the nuclear industry. A basic system may go for about \$65,000, Brunke said.

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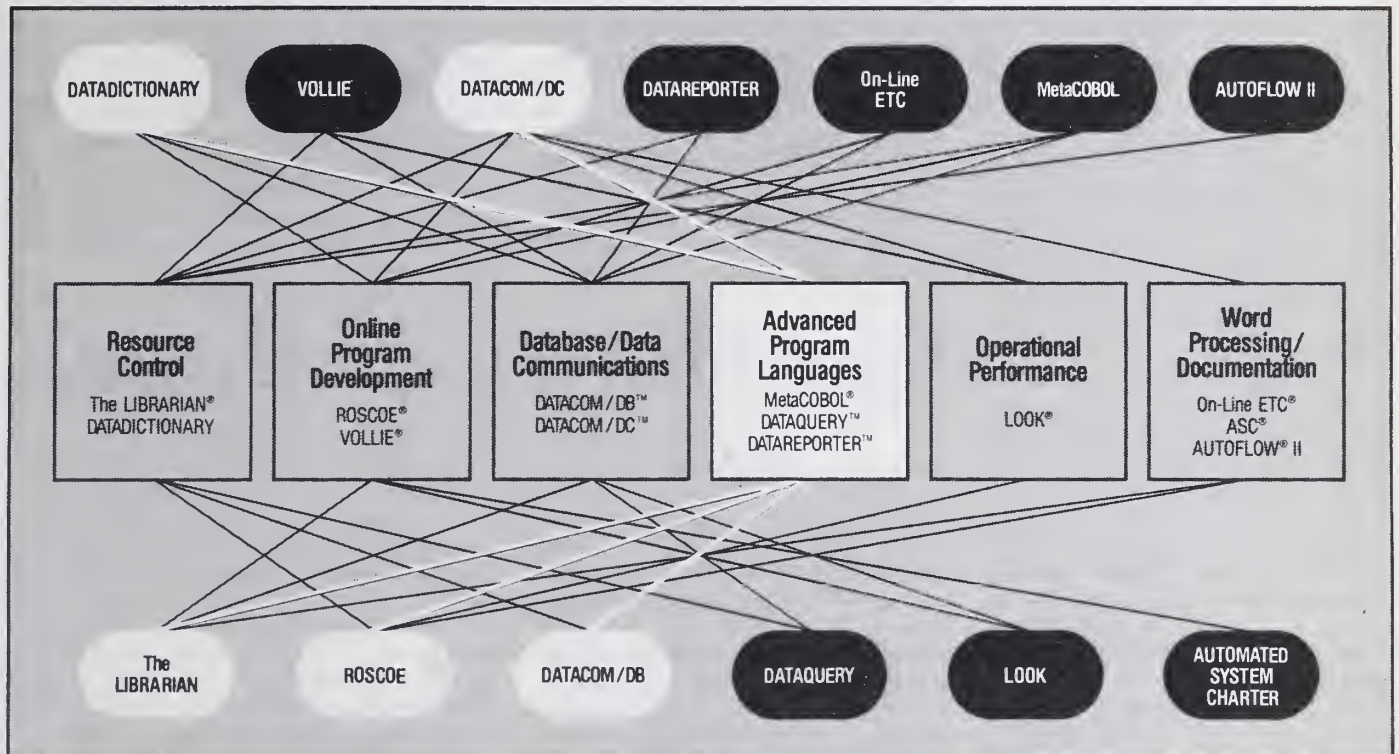
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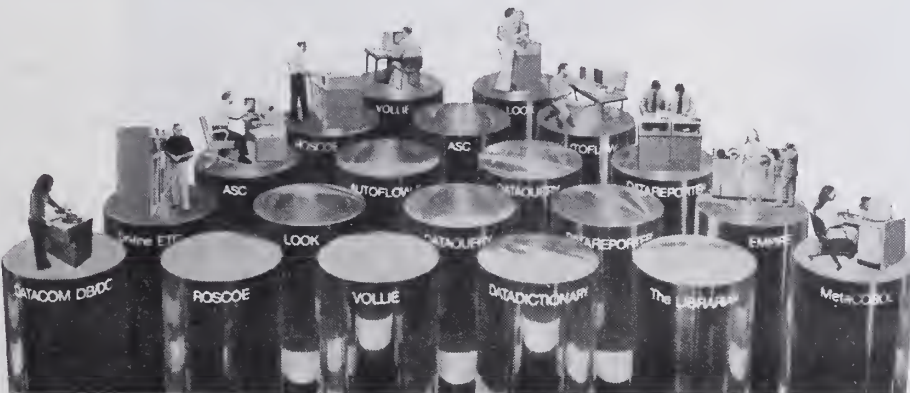
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HP Office Systems Billed as System/32 Upgrade

PALO ALTO, Calif. — Two system configurations targeted directly at the RPG marketplace have been announced by Hewlett-Packard Co. here.

Designated the HP 300 RPG/Advanced Function System, the products are additions to the vendor's office computer line, according to a company spokesman.

The HP 300 series represents an upgrade to IBM's System 32, an alternative to the System/34 and some of the features of the System/38 for the price of a System/34-type configuration, Tom Haney, product manager, claimed. Virtual memory and data base management were among the functions he cited as more typical of the larger System/38.

Approximately 80% of HP's business in the office systems area is done through OEMs, Haney said. However, the HP 300 will be available to what he termed "major accounts — Fortune 500 companies with in-house DP staffs."

Although the conversion process from an IBM to an HP system has been simplified through software enhancements, "it still takes technical expertise to do the IBM-to-HP conversion," according to Haney.

"Our major market is businesses doing from \$5 million to \$50 million in sales, he said. The marketing focus at the very large accounts will be to install multiple HP 300s in various departments within the organization, he continued.

Software Enhancements

Software enhancements were also announced which supposedly bring the HP 300 to "nearly total" compatibility with many computers which are currently running RPG software, according to the company. These include an IBM-to-HP conversion utility that converts RPG source code to meet HP requirements and converts data files based on the RPG program's file layout specifications.

Both packed decimal and binary fields are converted without manual

intervention, the company claimed.

Additional software includes a sort/merge 300 extension which converts IBM-type sorts on a one-for-one basis to HP 300 sorts and an RPG file maintenance utility that reportedly allows a user to enter and modify data, delete records and inquire against a file. Neither utility requires the development of additional programs, HP maintained.

The enhancements should be very useful to the OEM that has a library of application programs running on a System/34 and wishes to make those programs available to HP installations, Haney said.

The HP 300 features printer output spooling capability which, according to the company, reduces coordination problems on multiple-user systems. Main memory is preserved during short-term power failures through battery backup, and recovery from long-term power failures or system errors has reportedly been "simplified."

The vendor is also offering support for its Model 2635A printing terminal and 2640 series of CRT terminals on the HP 300, a spokesman said, and the protocol has been modified to allow the system to interface with other RS-232-type devices.

"We're currently running with a

Qume Corp. Sprint 5 printer," Haney said.

All three models in the HP 300 series include a processor, 256K bytes of main memory and an information display system. The price range for the newly announced Model 20 begins at \$50,000 with 100M bytes of peripheral memory, and the Model 30 with 240M bytes of disk storage starts at \$63,000.

Software costs are additional, with the RPG compiler priced at \$1,500. Current delivery estimates are eight weeks from Hewlett-Packard at 1501 Page Mill Road, Palo Alto, Calif. 94304.

Space Shuttle Lags May Delay Satellites

(Continued from Page 1)

Two major problems are responsible for slippage of the launch schedules: the thermal shield needed to protect the shuttle orbiter against the tremendous heat generated when it reenters the lower atmosphere, and engine trouble.

The shield is composed of approximately 31,000 specially fabricated ceramic tiles. The shuttle contractor — Rockwell International, Inc. — has been unable to develop a sufficiently strong bond between these tiles and an "underlayment" that separates the shield from the shuttle's aluminum skin.

As for the engines, recent tests indicate they will be ready in time for the launch as presently scheduled, a Nasa spokesman said last week. Meanwhile, a new bonding material is being applied to many of the ceramic tiles. It's a laborious, expensive process, the spokesman indicated, and may require delaying the initial launch an additional 10 to 11 weeks.

Plans Revised

AT&T, SBS and Western Union (in partnership with American Satellite Corp.), are among the carriers plan-

ning to launch communications satellites in the next five years. Others, such as Hughes Communications, Inc. and Southern Pacific Communications Co., are awaiting Federal Communications Commission authorization to do so.

In most cases, these carriers originally planned to use the shuttle, but realized some time ago that the launch schedule would slip and revised their plans accordingly. Nearly all plan to use the McDonnell-Douglas Delta 3910 launcher or an improved version known as the 3920 instead.

The chief result of this change will be to make some or all of each carrier's future launches more expensive. According to Irving Dostis, director of development at SBS, the cost of using the Delta is about \$23 million, as opposed to approximately \$7 million for the shuttle.

Because of the slippage, SBS has already decided to use the Delta to send up its first two satellites — in October 1980 and April 1981 respectively. Dostis expects the shuttle to be available by late 1982, when the final satellite in the first-generation SBS network is supposed to be put in orbit.

He added that the cost increases

probably will not force SBS to increase its rates, because launch costs represent only a small percentage of total costs. By next January, when the company expects to begin commercial operation, it will have invested close to \$400 million in hardware, software and support.

AT&T, which plans to launch its Telstar III series beginning in 1983, may use the Delta launcher for the first one, according to a company spokesman. But he "fully expects" the shuttle to be available by 1984, when the second of the new Telstar satellites is scheduled to go up. The final Telstar launch is scheduled a year or two later.

The spokesman added that Bell is also considering use of Ariane, a launch vehicle developed by the European Space Administration. Ariane can carry two satellites at one time, which means that AT&T probably could save money by using it, since the costs could be shared with another user.

However, Ariane has been having some problems. One successful test flight has occurred, but a second one ended last May in a nosedive into the sea when an engine misfired.

Abused ATM Gets Revenge

MONROE, Wis. — Malfunctioning machines have long been the victim of kicks, punches and blows from infuriated humans, but one vengeful computer here recently struck back.

When Robert L. Wenger pounded his bank's automatic teller machine (ATM) in its steely face, he didn't know that the vindictive computer was programmed to get even.

The first blow occurred one Sunday when Wenger tried to make a \$10 withdrawal from the electronic teller the day after he had deposited \$40. But because the deposit would not be recorded until the next business day, the machine refused to give up any cash.

Angry, Wenger punched out the defiant machine, knocking it out of operation. He might have tried to control his temper if he had known that the computer system was storing in its memory the identity of the last person to insert a plastic card.

The second blow was struck when Wenger was convicted of criminal damage. He was socked with a \$298 bill to repair the machine.

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Reputation Worse Than Actual Problems

Users Find System/38 Misunderstood System

By Tom Henkel
CW Staff

System/38's somewhat tarnished reputation has caused more problems than the actual system for three of the first users of the IBM machine.

Gearing up for problems that never materialized and chasing down rumored glitches that proved nonexistent wasted more time than actually setting up the system, said Larry Brenner, director of management information services at United Merchants and Manufacturers, Inc.

"This has got to be one of the most misunderstood systems ever," Brenner said. IBM's silence on what exactly went wrong to cause a one-year delay in delivering the CPU only made the problem worse by adding countless rumors of poor performance and inadequate software to an already disturbing situation for potential System/38 users, he added.

While one should bear in mind that IBM released the first users' names, all three seemed to echo a similar sentiment — namely, System/38 has some minor problems, but the system generally does what IBM said it would do.

"The general impression is System/38 doesn't work. That's just not true," Brenner said. "The reliability is here. I can compare it to a system that has been in the field a year."

Admitting that from a marketing standpoint IBM did not have much choice but to release a nearly problem-

free CPU — after taking an extra year to do so — Brenner said he has not had a major problem since the system was installed in April.

Smooth Conversion

The most advanced of the three first users, Brenner said both the interactive and batch conversions from RPG-II to RPG-III went smoothly.

The RPG-II-to-RPG-III conversion has been assailed by some as a key problem area for System/38. While Brenner said the switchover using IBM's conversion utilities "takes a lot of work," he quickly added there have not been any real problems, either.

Categorizing his former System/3 Model 15D shop as being "very mature," Brenner said IBM's conversion utilities caused him some extra work because they had to be tailored to his specific needs.

"It's very difficult to have a utility that is all things to all people," Brenner said, adding how much extra work has to be done depends on "where you are coming from and where you are going."

The conversions cause less experienced users some extra confusion by forcing them to do some extra work that may not be necessary, and they cause more experienced users more work by forcing them to tailor the utilities to meet specific needs.

However, despite the extra work, Brenner said IBM is on the right track.

The conversion utilities are designed to give the user a workable System/38. Additional tailoring can be done after the basic requirements are met, he said.

For the interactive conversion, any CCP programmer should be able to convert about three to five programs a day, Brenner added. Brenner also recommended programmers take advantage of IBM's System/38 conversion course.

On the batch conversion, Brenner said his same basic criticisms of the interactive conversion apply. "It can drive you out of your mind," he quipped, noting users can convert an average of 50 programs at one time. He said it took United Merchants three to four days to convert its batch programs.

Fewer Problems

Road Machinery & Supplies, of Minneapolis, Inc., has had fewer problems with a batch-only conversion, its DP manager Chuck Petter said.

Although concurring with Brenner that IBM's conversion utilities are very time-consuming, the user said it took about a day to convert all its programs from RPG-II to RPG-III.

Petter's major complaint was IBM delivered the manuals on its conversion utilities along with the actual software. The conversion process would have been much easier if the staff had had time to sit down and study the manuals, he noted.

Asked how IBM serviced the new systems, Brenner and Petters disagreed. While neither had disparaging words to say about IBM, Brenner said his service engineers (SE) didn't seem to be real experts on System/38. Petters, on the other hand, said his SE was well-versed in System/38's structure.

The third System/38 user whose name was released by IBM, Larry Peterson, DP director at St. Olaf College in Northfield, Minn., agreed with Petters that service was excellent and the IBM SEs knew what they were doing.

All three users agreed System/38 was better than System/3. However, Brenner said he missed some of the software enhancements, from other vendors, he had attached to his 15D. He added those enhancements will probably be available for System/38 soon.

All three users also said programming was easier on System/38. An order entry package that took about nine weeks to develop on System/3 took about three weeks on System/38, Brenner said.

The missing software on System/38 [CW, April 28], however, is a subject for disagreement. IBM program products like the Manufacturing Accounting and Production Information Control System (Mapics) will be sorely missed by Brenner, who is forced to run that package on a temporary System/34 until the System/38 version is available next summer — a year later than IBM promised.

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Extended Addressing Offered 3033 MP Users

(Continued from Page 1)
feature available for 3033 uniprocessor (UP) and attached processor (AP) versions — systems limited to attaching a maximum of 16M bytes and therefore unable to take advantage of 32M-byte direct addressing.

Why, then, is IBM aiming Extended Addressing at AP and UP sites at all? The firm itself admits the feature offers these users "no immediate benefit" except to "provide them with the certainty that there is a growth option." So "at the present time," IBM said, UP and AP users opting for this feature would have to upgrade to a multiprocessor before they could enjoy full 32M-byte direct addressing.

Taking this a step further, industry sources viewed the announcement of Extended Addressing — and its planned October 1981 availability to all three types of users — as IBM's way of "extending the upper end of life of the 3033." And by doing so, they surmised, IBM hopes to encourage users not to wait — by leasing rather than purchasing systems, for example — for the "H" series.

To tap the CPU power of two 16M-byte machines together with one copy of the OS operating system — the high-end 3033MP — users need to be able to directly address more than 16M bytes, the MP's current limit, according to one source who asked not to be named.

Noting that as CPU power increases, main storage must also increase, he added that the promise of 32M-byte direct addressing for existing processors signals that the "H" and all future large IBM systems "will clearly be able to directly address at least 32M bytes."

Cost Breakout

For 3033MP users, that capability will become a reality in October 1981, but will also come at a high price. Costs break out as follows:

- A 3832 Extended Addressing feature must be attached to each CPU and to the 3038 multiprocessor communi-

cations unit (MCU). If purchased, the feature costs \$93,900 per CPU and \$12,200 when attaching to the unit. Total: \$200,000. (Per CPU, Extended Addressing can also be rented for \$3,448/mo or leased on a four-year plan for \$3,135/mo. Per MCU, rentals cost \$440/mo; four-year leases cost \$400/mo).

- Two 3033 extension features, one for each CPU, are prerequisite for using Extended Addressing. These cost \$35,000 each. Total: \$70,000. (Per unit, rentals cost \$1,281/mo; four-

year leases cost \$1,165/mo).

- Four extended control store features, one for each channel group, are also prerequisite for Extended Addressing. These cost \$12,400 each. Total: \$49,600. (Per unit, rentals cost \$456/mo; four-year leases cost \$415/mo).

Added to this grand purchase total of \$319,600 is the cost of a monthly license for the MVS/System Product (MVS/SP) programs necessary to support Extended Addressing. Scheduled to be available in December are MVS/-

SP JES 2 Release 1 and MVS/SP JES 3 Release 1, each licensing for \$1,375/mo.

Release 2 of MVS/SP JES 2 and of MVS/SP JES 3 will be available in June 1981, licensing for \$1,475/mo and \$1,800/mo respectively.

IBM noted, however, that these MVS/SP programs will not support Extended Addressing until October 1981, at which time the firm plans to release updates to coincide with first shipments of the Extended Addressing feature.

Methods Hike Programmer Productivity

(Continued from Page 1)

cided against using within their particular organization.

Company management is pleased with the switch in techniques that has resulted in the productivity increase, Callahan said. Individual department heads "whom we refer to as customers rather than users" no longer react with cynicism when a programmer informs them that "we're here to help you."

The productivity measurement was based upon the increase in the lines of code generated by each programmer per day — a measurement system that is no longer being used, Callahan continued. "We're more interested in determining how often the systems meet the original time and cost estimates."

Current figures indicate that deadlines are met within a 94% to 95% accuracy range, and system costs are within the original estimate more than 75% of the time, he said. Although Callahan acknowledged that there were no figures available for comparison, he indicated that the general feeling within the information processing environment is that the current percentages represent a significant improvement over "prestructured" system statistics.

'Back-Door Approach'

Callahan's group also minimized the problem of resistance to the new tech-

niques from experienced programmers and designers by taking what he called a "back-door approach."

Programmers were not forced to use structured methodology, he said, but there was a sort of social stigma at-

'Individual department heads, "whom we refer to as customers rather than users," no longer react with cynicism when a programmer informs them that "we're here to help you."'

tached to the older techniques. The attitude was that "programmers are allowed to use conventional techniques if they are unable to comprehend the new structured techniques," he said.

This psychological approach resulted in an "I'll show you I can learn it" response from experienced staff members and "by the time they coded four or five [modules], they were hyped on it [structured programming]," Callahan said.

In addition to meeting with the approval of current staff members, structured methodology allows personnel with little or no programming experience to do "productive work" in three to five weeks, Callahan claimed. He maintained that a new staff member

with "some DP background or a computer science degree" could be productive in less than two weeks.

After this time span, the trainees were familiar with the usage of about 15 Cobol commands, which enabled them to code relatively noncomplex logic, he said. Editing input records and selecting data to generate reports were examples Callahan provided of the type of work these people could perform after several weeks of training.

The restriction to just 15 commands is viewed as an advantage in this environment and results in logic modules that look "almost identical except for the data names," according to Callahan.

This uniformity makes it easier for a new programmer to understand the logic in any given section of code, he said. Once the novice programmer is assigned to a particular application group, he continues with the specific training required for that area.

Programming standards at Central Maine include limiting a module so that it performs only one function, Callahan explained. This results in small logic sections which can be tied together into an executable program. The rule of one function per module is strictly enforced during the program walkthroughs by the author's peers.

Accent on Analysis

Approximately 95% of the programs at the installation are written in Cobol with the remainder coded in Fortran by engineers rather than programmers, Callahan noted. "We want our people doing the things that the machines aren't capable of doing and, with this in mind, the emphasis for people in information processing is on business analysis. Our goal is for someone to spend 15% of his time programming and 85% of his time on systems analysis."

In line with this philosophy and the commitment to better understanding between customer departments and the programmers and designers, Callahan is also experimenting with sales training for his staff members. "Hardware is so good and technology is so reliable that we are capable of designing any system that a business manager wants."

The next step is to move from the old mentality of the technician telling the user what he needs to the philosophy of "the customer is always right," with the user department functioning as a customer of the services supplied by the information systems specialists, he said.

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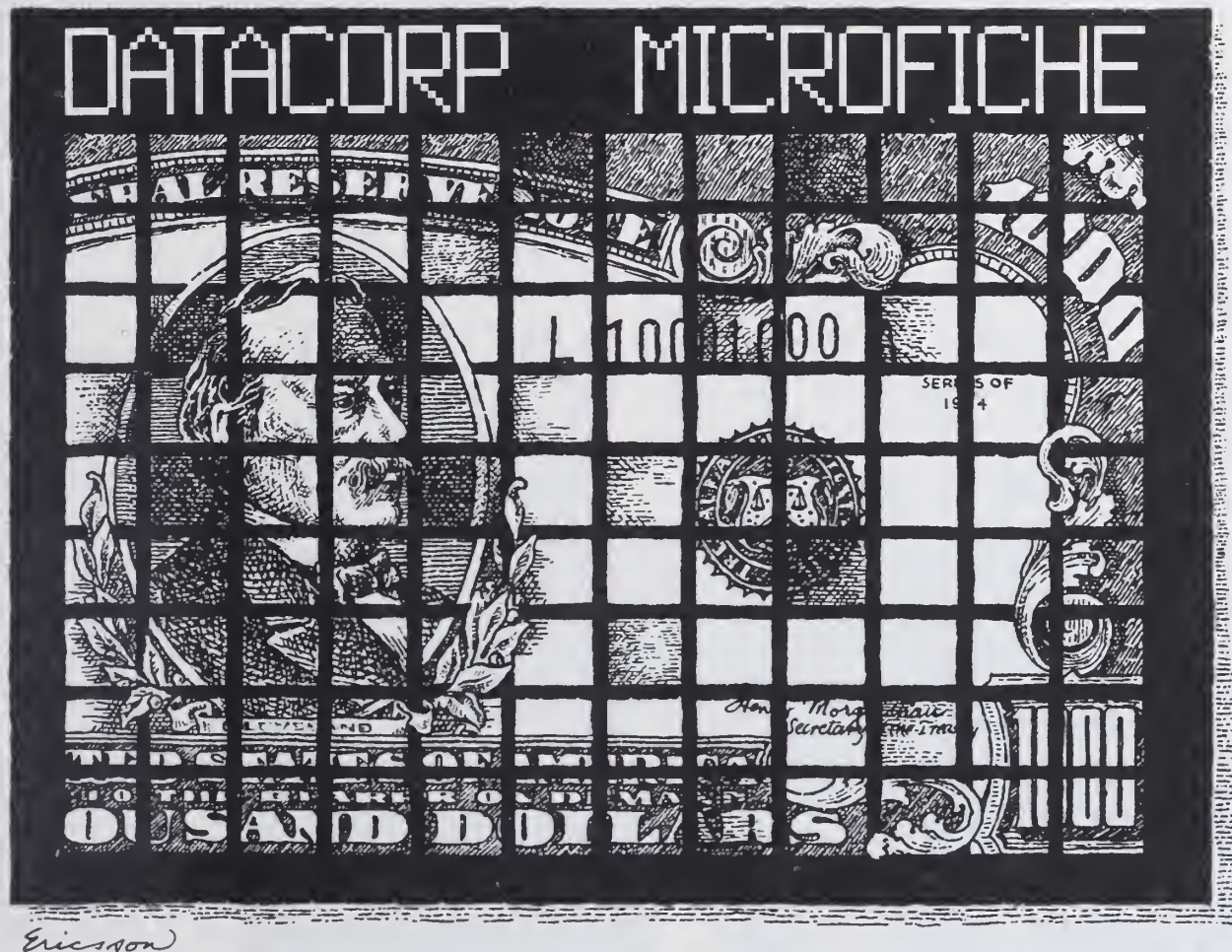
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CBS System Tracks Details at Convention

(Continued from Page 1)

roll call on Wednesday and the vice-presidential roll call on Thursday, it was undoubtedly the network's own reporting system that proved more valuable last week.

Both CRT terminal-based systems communicated over phone lines, using the interactive APL language, to CBS' two IBM 3033 mainframes at its New York City headquarters, and the news reporting system made use of three 1,200 bit/sec Anderson Jacobson, Inc. 860/121s, two Digi-Log Systems, Inc. Telecomputer II terminals and a 300 bit/sec Computer Devices, Inc. terminal for backup.

Delegate Interviews

For the CBS news reporting system, "we interviewed 1,985 of the 1,994 delegates to the convention and we put together a handbook that lists all the delegations by state and by the name of the delegate, as well as some information on each for our floor reporters to use," explained Warren Mitofsky, director of CBS News' Election and Survey Unit.

The 15-minute interviews gleaned "all kinds of demographics — such as age, sex, religion, income, occupation, race and ancestry — what their public or party office is, a series of questions on their vice-presidential preference, opinions about a number of prominent Republicans, how they were selected in this whole process, information about their expenditures to become

delegates and the cost of coming here," Mitofsky said.

Besides the handbooks for reporters, the data was also used to generate news stories to assign to floor reporters. "Maybe they'll try to talk to the 'vanishing Republican liberal' or people that prefer a particular candidate as vice-president," Mitofsky said early last week.

Another thing the system did is help run down rumors, particularly about the future vice-president while Reagan's choice was still up in the air.

Technologically, the system was expected to run smoothly. "We've been doing this since 1972, and essentially it's the same set of programs modified for some changes in the operating system," he said. Security for the system — which was updated constantly throughout the week — was ensured through use of a password system, he added.

Roll Call

As for the roll call vote tallying system, while it may have lain dormant for most of the week, when in use it provided complete vote tallies within "two to three seconds" after the last vote cast, according to Richard Silverman, deputy director of the Election and Survey Unit.

The system is based on two Hazeltine Corp. 1410 CRTs for data input, one 1410 located at the rostrum for verifying discrepancies between CBS' tally and the "official" tally, two Digi-Log

Telecomputer II CRTs for master control and display monitoring functions and two Anderson Jacobson 860 printing terminals for logging data entered and displays broadcast.

Also run by CBS in the last two presidential election years, the tally function was not computerized until 1976, Silverman noted.

Since NBC handled the "outside pool" at the convention this year — meaning it was in charge of all cameras and activities outside the convention hall — it logically should have handled the vote tallying system, which is traditionally an "outside pool" activity, Silverman noted.

"But since [CBS] had developed the software and the technique for use in 1976, and since NBC's cost proposal to redo a system that existed and worked well four years ago was considerably more than it cost us to implement it again, it was felt appropriate for us to do it," he said.

In a roll call, states are called, usually in alphabetic sequence, and each of the

54 delegation chairmen indicates how his delegation has cast its votes.

Located outside the hall in a trailer — "one among many that all the networks have" — vote tally personnel listen to the audio of the roll call as it happens, Silverman said.

"Each operator works independently, inputting what he or she thinks he heard. Only when the two agree with each other does the program take that data and actually update the tabulations up to that point," he said.

"If they don't agree, then error messages appear and of course we try to resolve the situation," he added.

The end product is a constantly changing alphanumeric video picture of the data. "That video is fed from our trailer to the separate control rooms of the three networks, who are each doing their own broadcasts," Silverman explained. "The director of each network makes his own decision as to when to put each particular display on the air."

ABC Marks New Beginning

(Continued from Page 1)

they needed.

Just as the GOP sought to unify the disparate elements that marked the Ford-Reagan schism in 1976, ABC was trying to bring together a melange of peripherals that had defied past attempts at reconciliation.

The linchpin that finally succeeded in bringing together almost 70 terminals in Cobo Hall, the Joe Louis Arena and ABC News headquarters in New York City was a multiplexer that simulates a dial-up protocol and led an IBM 370/168 into thinking it was receiving a dial-up rather than a dedicated line.

The system was based on 11 Timeplex, Inc. Series II Microplexers — eight at the convention site, two in New Jersey feeding an IBM 3705 communications controller and one in New York.

"The multiplexer turned out to be the only one that could fool the IBM system into giving us a clock at the master location, the computer, while the terminal clocked the multiplexer at the other location," said John Congedo, manager of data processing and election facilities for ABC News.

Limits Overcome

The ABC system, which used six telephone lines leading to the 8-million-byte 370/168 in Raritan, N.J., used an unmodified version of IBM's Customer Information Control System (CICS) which only supported dial-up communications. But "we didn't want to dial up 50 terminals," Congedo noted.

The CICS needs data set ready, and the terminals on the other end bring up data terminal ready. The multiplexers made the change.

Another problem was the 1,200 bit/sec limit on asynchronous terminals tied to the IBM system, Congedo said. He wanted more speed — and he got it.

Clocking had to be done externally in order to avoid the 1,200 bit/sec limit. Using an adaptive autospeed option, the multiplexer changed the input speed whenever required without altering the 3705 that front-ended the 370.

"We're running teletypewriter terminals at 4,800 bit/sec, which is the maximum speed of the line we're using," Congedo noted, "and we may go to 9,600 bit/sec in November [for the general election]."

The adaptive speed option gave the system the flexibility to meet the array of terminals on their own terms, and the multiplexer adjusted itself automatically as soon as it received a one-character signal.

Control Provision

Congedo maintained operational control over the system by having the multiplexers equipped with a supervisory port that allowed him to monitor the entire system — the current configuration of each channel, the data traffic load on each channel and how close it was to capacity — from any CRT terminal.

There were very few problems with the system, Congedo reported. Some cables were stretched out of shape and an occasional terminal was left on, but other than that, "it worked beautifully."

Reynolds and Koppel were not the only editorial benefactors of the system. Reporters on the convention floor were able to access minutiae on obscure delegates, primary voting totals or whatever they needed by plugging their Texas Instruments, Inc. Model 745 terminals into an outside phone.

If ABC decides to put together a worldwide editorial network based on the Detroit model, a task Congedo said would cost approximately \$5 million over five years, correspondents would have portable text editors instead of typewriters.

But the worldwide system is far from reality. No data is being collected for it yet and top ABC executives, while reportedly impressed by the system's performance in Detroit, have made no commitments to development, according to Congedo.

"This is really a demonstration to show management we can do it," he said, "but we need a transfusion of money."

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Despite Civil Rights Objections Packard Touts South Africa, Slight Nebraska

By Bruce Hoard
CW Staff

SANDTON, South Africa — "Some states back home say they intend to boycott U.S. companies which trade with South Africa. Well, that doesn't worry us at all, we're going to continue to trade. I'd much rather lose business with Nebraska than South Africa."

Those words were delivered here at the recent ground breaking for the South African subsidiary of the Hewlett-Packard Co. They were spoken by David Packard, HP's chairman of the board, and reported by the *Rand Daily Mail*.

The industry mogul apparently took umbrage with the Cornhusker State because its legislature passed a resolution condemning apartheid and urging state investment officials to remove the names of corporations and banks with investments in South Africa from its approved list.

Apartheid is the political system in South Africa under which the 19 million black Africans composing approximately 85% of the population are confined to 10 impoverished "bantustans" and three "independent countries" by the white minority. Together, those areas amount to 13% of the country's land area.

Apprised of Packard's comment, Steven Fowler, Nebraska state senator and one of the resolution's sponsors, said, "I'm surprised that an executive of a corporation would feel that way, particularly someone who held a responsible government post [Packard was deputy secretary of defense under Richard Nixon from 1969 to 1971]. I don't think it will sit well with the people of Nebraska."

Low Profits

While the brouhaha over HP's business dealings with Nebraska is likely to blow over relatively soon, the intractable question of its South African investments promises to be an enduring one.

In 1979, the company reaped \$15 million from South African sales, less than 1% of its worldwide \$2.36 billion total. That \$15 million would have been considerably higher had the U.S. government in February 1978 not slapped an embargo on the export of all goods to the South African police and defense forces.

Despite the relatively low profits, Packard has his reasons for remaining in the racially troubled country. One of these is strategic, but the executive also believes U.S. commercial interests in South Africa upgrade the life-styles of all its inhabitants, both white and black, he has said.

During his recent visit here, he told the *Financial Mail* he was "immensely interested in the so-called problems of South Africa. I'm encouraged by what's being done here."

Sullivan Principles

Presumably, he is encouraged because HP and approximately 130 other U.S. multinationals are doing their bit to end apartheid by adhering to the so-called Sullivan principles, drawn up in 1977 by Rev. Leon Sullivan of Philadelphia, a civil rights activist, the first black ever elected to General Motors' Board of Directors and also the head of

Opportunities Industrialization Center.

The Sullivan principles state that signatories shall make a "substantial commitment" toward:

- Nonsegregation of races in all eating, comfort and working facilities.
- Equal and fair employment practices for all employees.
- Equal pay for all employees doing equal or comparable work for the same period of time.
- Initiation and development of training programs that will prepare in substantial numbers blacks and other nonwhites for supervisory, administrative, clerical and technical jobs.
- Increasing the number of blacks

and other nonwhites in management and supervisory positions.

- Improving the quality of employees' lives outside the work environment in such areas as housing, transportation, school, recreation and health facilities.

HP's Rating

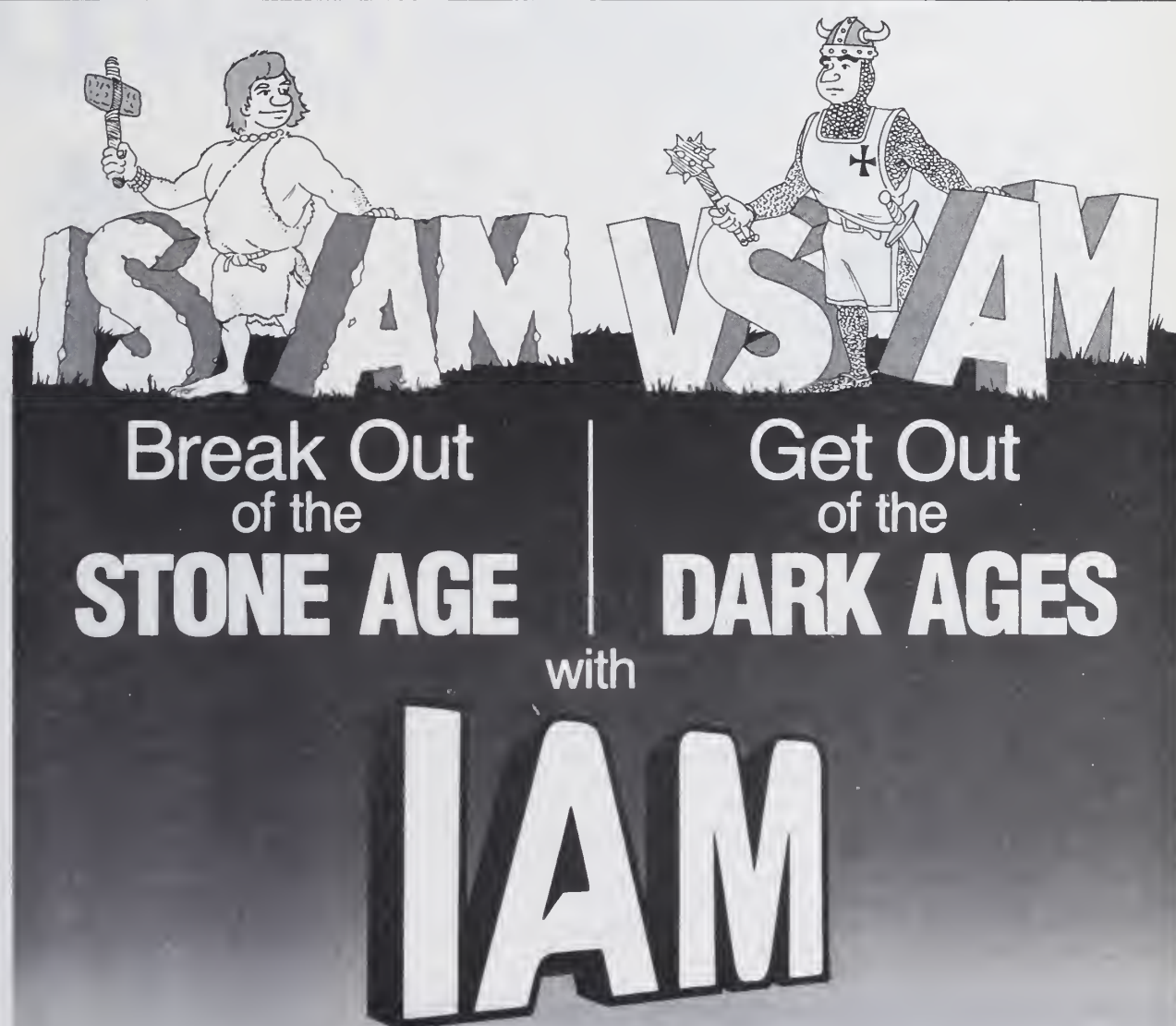
Participation by U.S. multinationals is self-monitoring; the companies involved write up their own reports of what they are doing. In 1978, Sullivan released a report on implementing the principles prepared by the consulting firm, Arthur D. Little, Inc. (ADL).

HP was rated in the top 22 of 105 companies evaluated. It fell under the

category of "making good progress." The company currently has 113 employees in South Africa working at three offices, and 14 of them are non-white, according to a spokesman.

"All benefits, wages, medical plans, cafeterias and social events are offered to blacks as well as whites," he said. There is neither a black management training program nor any blacks in top management positions because of the difficulty of finding educated blacks, he added. However, 10 of the 14 black employees have received training: five for clerical and technical and five for literacy.

In contrast to the claims of HP and
(Continued on Page 11)



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Not Eligible for Patent Honeywell Firmware is Software: U.S. Brief

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Any use of firmware in DP equipment is software and as such is not eligible for patent protection, the patent office said in a brief to the U.S. Supreme Court recently.

The court has adjourned for the summer without taking up a case involving a disputed patent application for a Honeywell, Inc. firmware-based module in its Series 60 Level 64 product line.

The court agreed in March to consider the case after the U.S. Patent and Trademark Office said the Court of Customs and Patent Appeals (CCPA) erred in ruling the "switch system base mechanism" should be considered for a patent as a new machine [CW, March 24].

The government's Supreme Court brief sought to place the argument entirely in the realm of software patents and only lightly touched on Honeywell's contention that the device is primarily hardware, not software.

"All computer-implemented algorithms are equally unpatentable," the government said. It is not "significant that the novel computer program at issue here is firmware (a microprogram stored in a control unit) rather than software (a program stored in a computer's main memory unit).

"Firmware does not convert the conventional computer designed to accept firmware of this type into a new patentable machine," according to the patent office attorneys.

Disputed Device

At the center of the disagreement is a device submitted for patent in 1975 by two Honeywell employees. It is a firmware module that manipulates system base information in both main memory and internal scratchpad registers.

The patent office first ruled the function could be performed by software. That the function was in "apparatus" format rather than "method" format did not make the invention any less related to an algorithm and it is thus unpatentable, the office and its board of

appeals said.

But the CCPA later accepted Honeywell arguments that the device is a machine and should be considered as such for a patent. The CCPA decision was then appealed to the Supreme Court by the patent office.

Honeywell attorneys have tried to keep the question of software patents out of the case and to have the argument decided on the narrow issue of whether or not the module is a new type of machine. That attempt has been largely unsuccessful — almost necessarily so, in light of the court's acceptance of the case based on patent office arguments that the device is primarily software.

Supporting Brief

Also, an *amicus curiae* brief filed by National Semiconductor Corp. backs the government's argument and strongly urges the court to turn down the patent because, the company said, software patents would "stifle . . . technological change and competition."

The government's brief, while constituting a lengthy case for not permitting software patents under current statutes, does touch on the question of whether or not the Honeywell device is a machine.

The government argued that it does not matter whether it is a machine because the device is essentially the application of an algorithm and therefore unpatentable.

The Honeywell "idea for transferring data between the scratchpad registers and the main memory of a digital computer is embodied in the algorithm represented by the flow charts" of the original patent application, the government brief said.

The patent office, in considering Honeywell's contention that the device is a new machine, said the use of a computer to implement firmware does not make the device patentable — the computer is not a new device and the firmware involved is unpatentable because it is essentially software.

"The only machine involved here is the familiar general-purpose digital computer," the patent office said.

"Employing a new computer program (whether that program is conventional software or a new microprogram . . .) does not change how the designers of the computer contemplated it would operate," the government argued. "It merely describes one inherently available operation of the already patented machine."

"A program directing a series of sequential steps is the essence of both [firmware and software]. The algo-

rithm is no less [unpatentable] when claimed as part of firmware." The Honeywell control unit "is capable of being implemented with a variety of instructions," the brief said.

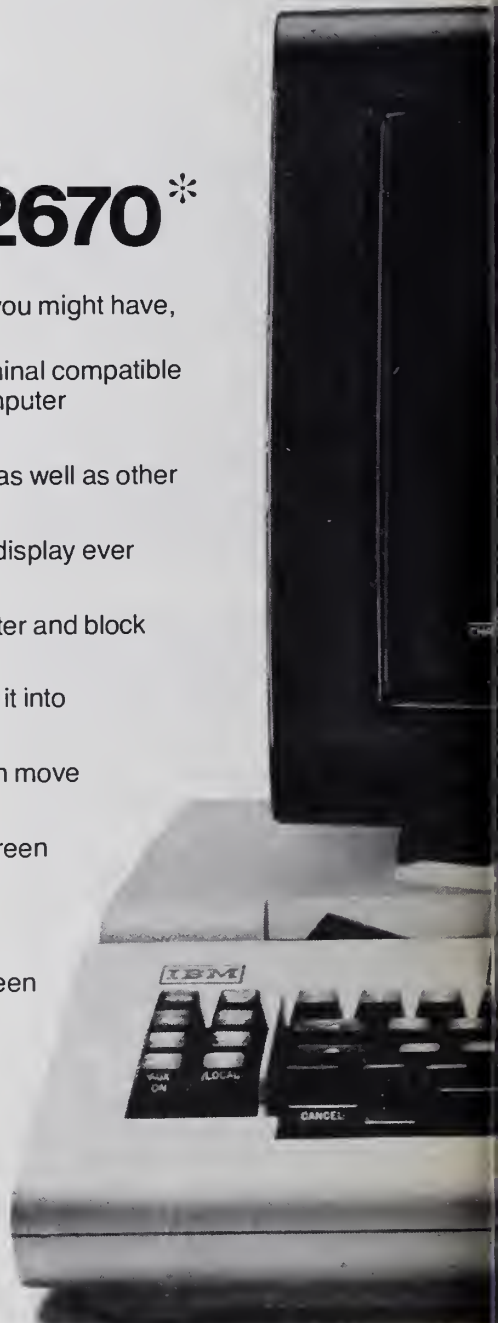
The court's ultimate decision could have a profound effect on the DP industry. The patent office estimated there are more than 3,000 patent applications pending "in which the patentability of computer software or firmware is a potential issue."

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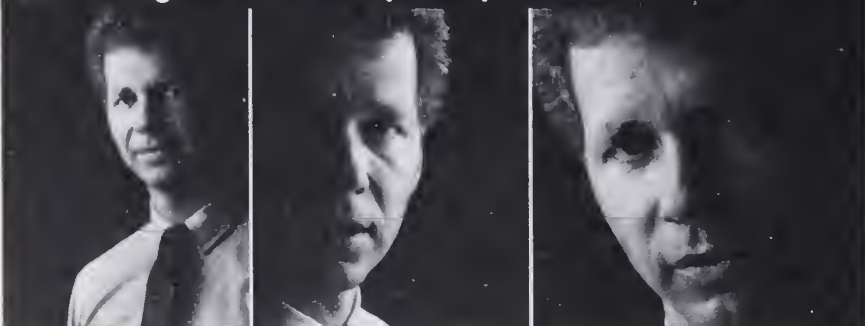
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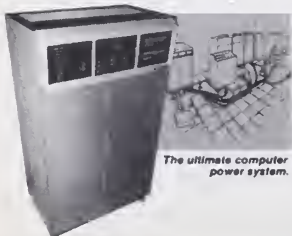
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HP Invests in Racially Troubled South Africa

(Continued from Page 9)

other Sullivan signatories is a report written by free-lance writer Elizabeth Schmidt for the Washington D.C.-based Institute for Policy Studies, an independent, nonprofit research institute.

Entitled "The Sullivan Principles, Decoding Corporate Camouflage," the report takes a second look at some of the signatories' claims.

To begin with the "substantial commitment" the companies were supposed to exercise in their quest for

compliance was never defined and, as such, is "very, very arbitrary," according to Schmidt.

The equal pay for equal work provisions are also "very deceptive," she claimed, adding "71% of black workers work in segregated job categories." The categories are not officially segregated, but because of the low level of work performed, only blacks are employed, creating a de facto segregation standard.

"And when they talk about their toilets and cafeterias being integrated, of-

ten, instead of [segregating] by color, they say 'now we have a cafeteria for the hourly workers and one for the salaried workers.' And there are very, very few black salaried workers in these companies."

Overall Effects

The ADL report glosses over several similar situations making the overall scene look much better than it actually is, Schmidt charged.

The South African managerial work force is approximately 96% white and

2% black. If every black in managerial training programs were hired, the figures would shift from 96% to 94% and from 2% to 4%.

The Investor Responsibility Research Center produced a report in which it claimed many top computer companies spend an average of \$67,000 for the training of whites and \$3,000 on blacks.

The blacks are trained to be typists, and the whites move on to more skilled occupations, Schmidt said.

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U.S. Computers on Germans' Minds

Nobody here has been spending too much time worrying about data processing lately. What has really been on people's minds is soccer — the West German team won the European Championship without our two best players — "Kaiser" Franz Beckenbauer and "Bomber" Mueller! And that's something worth writing about!

But there is some computing news-worthy of mention in a letter to America — after all, German DPs are as attracted to American computers as they are to soccer. And sales of U.S.-

made computer systems here in recent years are good evidence.

Sales of U.S.-made general-purpose computers, small business systems, word processors and copiers in the Federal Republic of Germany increased by 22% between 1978 and 1979, going from \$790.9 million in 1978 to \$961.6 million in 1979.

According to the Federation of Distributors for Office Organization (Bundesverband der Vertriebsunternehmen fuer Bueroorganisation), imports from the U.S. now comprise

19.4% of the German market and the Federation expects that number to increase by 10% by the end of 1980.

While the prices for office products have remained nearly constant, prices for computers have dropped an average of 6.1% with prices falling so drastically, German information managers seem to be willing to buy more hardware, a Federation speaker noted at a recent conference.

Few Surprises

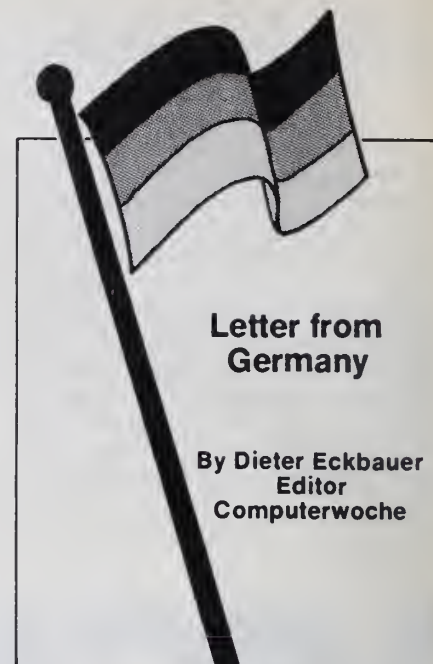
Believe it or not, German information managers do not expect any more economic surprises in the foreseeable future, but this doesn't mean there will be no more surprises in the German market.

One development that hit the German market like a tornado was Nixdorf Computer Corp.'s entrance into the PCM club.

Not so long ago, Nixdorf was regarded as a typical small business computer manufacturer with no intention of competing against the large mainframe companies. But now Nixdorf has taken the first step into the IBM market with the acquisition of The Computer Software Co. in Richmond, Va.

Nixdorf's recently founded subsidiary, Compatible Information Systems (CIS), will offer a complete DOS-oriented system in the fall of 1980.

However, Nixdorf's announcement impressed IBM's competitors such as Siemens, Univac, Honeywell, Inc., NCR Corp. and International Computers Ltd. more than it did IBM users, according to a quick survey of the *Computerwoche* staff. Many users interviewed said it is not enough to take over an American software company and offer the products on the German



Letter from Germany

By Dieter Eckbauer
Editor
Computerwoche

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Replacement Up Within a Week

Salt Water Leakage Wrecks Hospital PDP-11/70

By Brad Schultz
CW Staff

NEWPORT NEWS, Va. — Salt water from leaky pipes totally destroyed the Digital Equipment Corp. PDP-11/70 at Riverside Hospital here recently. But DEC had another 11/70 running as a replacement CPU within the week, helping the hospital avert a major loss of critical DP operations.

As one of 23 health care organizations tied remotely to the Hospital Data Center of Virginia (HDCV) in Norfolk, Riverside used its 11/70 to support emergency room, bloodbank, pharmacy, laboratory and various clinical functions, according to HDCV systems and programming manager Ed Volkstorf. Other critical tasks included patient registration and monitoring of treatments.

The blood pressures of Riverside DP personnel rose therefore when they entered the basement 11/70 facility on the morning of June 23 to find the hospital's computer sprayed with corrosive salt water that had dripped through the previous night from the ceiling and into the computer's air intake port, which generates a powerful suction current.

The salt water came from a laboratory located directly above the basement, Volkstorf explained, where it was used to clean instruments that analyze blood. A few days before the 384K-byte 11/70 was showered, a break occurred in the plumbing installed between the lab's floor and the computer room's ceiling as an overflow drain intended to prevent flood damage in the lab.

Unnoticed Rupture

No one had noticed the plumbing rupture, Volkstorf said, nor the gradual accumulation of salt water above the computer room ceiling. Eventually, the ceiling's tiles separated under the strain, sending the water into the machinery that is supposed to blow cooling air onto the 11/70's CPU and tape drive cabinets.

Instead, the air conditioner blew salt water. Riverside Hospital's information systems director, Barbara Baldwin, called in DEC service personnel immediately after discovering the damage and notified the HDCV, which began finding a way to shoulder most of the hospital's major DP tasks, pending the installation of a replacement.

DEC had the alternative hardware in Riverside's basement within 24 hours, Volkstorf said, but the process of systems generation and checkout took a week to complete. DEC provided around-the-clock support through that week, according to the vendor's

computer engineer on the scene, Tom Perkins.

Normally, emergency replacements of computer systems are supported on an eight-hour per day basis, Perkins noted, but DEC skirted this policy because Riverside's applications were so critical to the Newport News area.

Riverside sent disk packs of its software to the PDP-11/70 run by the HDCV in Norfolk. That 11/70, two DEC PDP-15s and a Honeywell, Inc. 66/10 mainframe bolster the computing resources of organizations affiliated with the nonprofit HDCV, Volkstorf stated. The affiliates communicate with this complex via asynchronous General Electric Co. printer

terminals and various CRT terminals [CW, June 23].

With HDCV's help, Baldwin opened 12 communications lines that allowed Riverside Hospital personnel to run critical applications remotely. While DEC field technicians readied the replacement CPU, Volkstorf gave Riverside users high priority access to the HDCV's 11/70.

The 12 lines were multiplexed and open about five hours after Baldwin alerted the HDCV, Volkstorf said. This makeshift link kept Riverside's DP operations alive as the hospital swept salt out of its basement and DEC's Field Service Logistics department tracked down an 11/70 available

for fast delivery to Newport News.

After Perkins completed diagnostics tests on the substitute system, Baldwin retrieved the hospital's software disk packs and ran them for six hours on the new processor to verify that Perkins' go-ahead was well-founded.

According to Volkstorf, Riverside's operations are getting back to normal except for problems with the computer room's battle-scarred air conditioning system. The troubles may be caused by "dirty power" from the Virginia Electric Power Co., which regularly creates "brownout" conditions — sustained reductions of current — that upset the delicate circuitry of its customers, the HDCV manager maintained.



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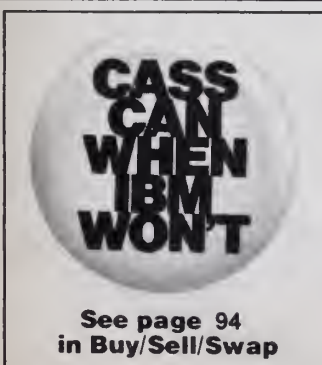
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MCI Calls \$1.8 Billion in Damages Justified

By Phil Hirsch

CW Washington Bureau
CHICAGO — It may be a whopper, but it is justified.

That is the gist of MCI Communications Corp.'s latest statement concerning the treble-damage \$1.8 billion antitrust judgment it won here recently against AT&T.

MCI was responding to an earlier statement, filed by AT&T, that argued that the award was excessive the phone company asked U.S. District Court Judge John F. Grady, who presided over the trial, to either overturn the verdict or order a new trial.

MCI contended that the basic damage award — \$600 million — represented fair compensation for profits lost because of AT&T's behavior. MCI said it had been "excluded from over 80% of the

market, its construction plan [had been] frustrated and its business nearly destroyed."

The company also contended that the verdict had been trebled "in order to punish and deter. The \$1.8 billion

judgment may include a windfall for MCI, but, in the boardrooms of American business, that 'windfall' may be doing more to cause compliance with the antitrust laws than all the nation's enforce-

ment agencies combined." The district court verdict will soon go to the U.S. Court of Appeals for review, and from there it will probably be referred to the U.S. Supreme Court for a final decision.

House Judiciary Asks to Review Rewrite Bills

By Phil Hirsch

CW Washington Bureau
WASHINGTON, D.C. — The House Judiciary Committee has added its voice to a growing chorus clamoring for further consideration of the "communications act rewrite"

bill before it is finally voted on by Congress.

Congressman Peter J. Rodino (D-N.J.), chairman of the committee, suggested that it might be a good idea to let his group review the House version of the legislation. His comments echoed a similar statement made late last month by the Senate Judiciary Committee [CW, July 7].

Several computer industry groups have also suggested further consideration of the Senate bill — S. 2827 — before it is reported to the Floor, and they have been working hard to change the House of Representatives version, H.R. 6121, which is now in the throes of final markup within the House Commerce Committee.

Further action on both bills awaits the return of Congress from its current recess, which ends today. The House will remain in session until Aug. 2, and the Senate until Aug. 7. Then, both Houses will be in recess until the week of Aug. 17.

Rodino, in a letter to House Commerce Committee Chairman Harley W. Staggers (D-W.Va.), said that the restructuring of AT&T contemplated by the House bill will have "a dramatic effect" on the Justice Department's antitrust suit against the phone company, as well as on a number of pri-

vate suits; the result could be to impair the ultimate settlements.

H.R. 6121 contains language designed to prevent this, but Rodino said that even so, "it is apparent H.R. 6121 will necessarily impact the pend-

ing antitrust litigation."

Basically similar concerns were expressed late last month by the Senate Judiciary Committee about S. 2827, which is awaiting markup within the Senate Commerce Committee.

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OAK BROOK, ILL. — The Association for Rehabilitation Projects in Data Processing will soon be receiving instructional material at cost from Deltak, Inc.

The association, which is concerned with educating the disabled for jobs as application programmers, will get the use of Deltak's library of approximately 2,000 instructional courses that incorporate advanced video-based instructional techniques.

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Because They Are Juveniles

Students Tied to Datapac Breach Not Charged

By Brad Schultz
CW Staff

NEW YORK — Four 13-year old Dalton School students involved in

breaching computer systems linked to Canada's Datapac packet-switched network will not be prosecuted because they are juveniles, according to

Ira Bloch, deputy chief of the criminal division of the U.S. Attorney's office of New York's Southern District.

Bloch cited the Federal Juvenile Delinquency Act as grounds for that decision.

But Bloch did not rule out the possibility that others may be charged in the case eventually. Federal authorities in the U.S. and Canada are still investigating how the teenagers manipulated the Datapac-linked computer systems from terminals attached to Dalton's

New York Telephone Co. telephone ports [CW, May 12].

The tampering spree apparently did not result in major losses for Datapac users, but U.S. law enforcers are still unsure about the identities of all victims, Bloch indicated.

One victim was a Montreal-based producer of cement and construction materials, Canada Cement La Farge, whose 80M bytes of disk storage support a dual processor configuration of Digital Equipment Corp. PDP-11/34s under RSTS/E.

Terminal Lets Deaf Convert Messages to Voice by Phone

MADISON, Wis. — Using a device that emits over a telephone line a human voice that was converted from a typed message, the deaf will have a new vehicle for communicating with each other and the hearing world.

Development of the communications terminal — currently being manufactured and distributed — means the deaf can now send messages to doctors, bank tellers, grocers, friends or any individual without the bulky teletype terminals that have restricted past communications.

The party being called can send a response by using the Touch-Tone or dial clicks of the phone. The returned message appears as typed words on a display panel on the deaf person's telephone device.

The voice of the terminal, which was developed by electrical engineer Robert Engelke, has a basic vocabulary containing enough words for the average conversation as well as words oriented toward emergency messages such as "Send an ambulance." Addi-

tional modules can be added to expand the vocabulary.

The device has a computer capability that allows it to receive and transmit both the common Baudot and Ascii codes, and if the synthesized voice does not "know" a word, it spells it out.

Another feature is a magnetic sensor that detects when the phone is ringing and automatically flashes a house lamp to alert the deaf person to the call.

A 1,000-char. memory (which can be doubled) that stores previous conversations is also available. The message can be played back on the display panel any time. In addition, emergency messages can be "remembered" and sent without having to be retyped.

The price for the terminal is approximately \$700. Assistance in the design and marketing of the aid was provided by the University of Wisconsin-Madison Trace Research and Development Center.

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Testimony to Arson

SPRINGFIELD, Ill. — A row of tape reels transformed into a nest of silver serpents, the molten mouth of a baked CRT terminal and charred remains of a data document serve as mute testimony to the intensity of the heat that accompanied a fire in the basement remote job entry (RJE) station of the Illinois Public Health Department this spring [CW, April 14].

The arson-caused blaze was blamed for an estimated \$507,000 worth of damage, but its effects have been erased and processing resumed. Unfortunately, the arsonists are still at large and police have no promising leads.

The Department of Public Health has taken steps to prevent a recurrence of the disaster. Locks have been changed, a fire alarm connecting the RJE with the fire department has been installed and janitors are not allowed in the basement after 6 p.m.



Photos by Julie Gaseor

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Info 80 Keynoter Envisions Office 'Enterprise System'

NEW YORK — In tomorrow's office, paper will be increasingly absent and management decisions will be based on various forms of electronic information, according to Allen J. Krowe, IBM's vice-president and president of the firm's System Communications Division.

Krowe will be detailing these and other ideas on what he calls the "Enterprise System" as the keynote speaker at this fall's Information Management Exposition and Conference (Info 80), scheduled to take place here in the New York Coliseum. The conference will run from Oct. 6-9 and consist of 14 "conferences-within-a-conference." More than 4,000 executives are expected to attend the four-day show sponsored by Clapp & Poliak, Inc., a spokesman said.

Krowe's address, "Enterprise Systems: A Concept for the Eighties," will emphasize the convergence of technology, office systems, data processing

and communications into one coherent system. The Enterprise System would contain many of the concepts associated with the "office of the future," such as electronic mail, shared key entry, intelligent copiers, interactive computing and distributed processing. The system would also encompass centralized and decentralized forms of data, text and image processing including graphs, logotypes and, possibly, voice, the spokesman said.

Registration fees for the conference and exposition are \$295 for the entire four days, \$110 for one day and \$60 for a half-day. All of the fees include admission to the show floor. To see just the exhibits, attendees will be charged \$10 at the door, or \$5 with a special Info registration card, the spokesman said.

Additional information can be obtained from Clapp & Poliak at 245 Park Ave., New York, N.Y. 10017.

IRCs' Telex Rates Offer 55 Cent/Min Discount

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — "Unbundled" international telex rates, offering users 55 cent/min discounts, are now being offered by all the U.S. international record carriers (IRC). To qualify, the user must provide his own terminal and access line.

The first of the new tariffs — covering international telex services offered by ITT World Communications,

Inc. — became effective recently. Last week, the other U.S. IRCs began offering similar rates.

Generally, users with large volumes of international telex traffic will benefit from the new scheme; they will save enough in usage charges to balance or exceed their terminal/access line costs. Since the cost of local access is a function of distance, those users in cities served directly by the IRCs will need less traffic volume, typically, than those in outlying areas.

Last December, when the Federal Communications Commission (FCC) ordered the carriers to offer unbundled rates, the commission also expanded the number of cities served directly by the IRCs. Previously there are five such cities (New York, Washington,

D.C., Miami, New Orleans and San Francisco). Now there are 21 more, and additional localities are likely to be served directly by the IRCs in future.

The 55 cent/min discount has been available for several months on an optional basis. Customers had a choice of foregoing the discount and getting "free" access — paid for by the IRC — or supplying their own access and receiving the lower rate. Users in the former group used IRC-provided tie lines or Western Union Telegraph Co.'s domestic telex/TWX circuits. The telegraph company collected from the IRC, rather than the user, for the call.

Under the new scheme, tie lines are still available, but the user pays separately for them and receives the usage discount. Access via Western Union

remains available on either a bundled or unbundled basis.

However, the bundled version apparently is available only on a limited basis. TRT Telecommunications Corp. said it is the only IRC offering "free" access, without the discount, to international telex customers connected to Western Union's domestic telex/TWX network.

The FCC is now analyzing the newly unbundled rates to determine whether the 55 cent/min discount is enough. The commission indicated there is some evidence suggesting that the IRCs, by charging separately for terminals and access lines, have saved enough to justify a reduction of the former bundled telex rate by more than 55 cent/min.

Bell Services To Cost More

CW Washington Bureau

WASHINGTON, D.C. — The U.S. Court of Appeals late last month upheld the use of fully distributed costing (FDC) to determine the rates charged by AT&T for its communications services. It is a decision that seems likely to have far-reaching impact on telecommunications users.

One likely result is that AT&T rates for its competitive data and voice services will go up. This probably will encourage new offerings from the specialized carriers priced below Bell's rates. The specialized carriers should also have an easier time introducing new services.

Last month's appeals court decision stems from a series of actions taken by the Federal Communications Commission (FCC) three years ago. At that time, in addition to requiring that the phone company employ FDC, the commission also declined to stop AT&T from terminating Telpak and found unlawful a number of AT&T private-line rates. Last month, the appeals court remanded these rate decisions back to the FCC for further consideration.

Telpak is a bulk-rate offering that allows a user with high traffic volumes between common points to lease circuits at substantial discounts. AT&T decided to terminate the service in 1977 after the FCC ruled that the phone company would have to allow sharing and resale of Telpak circuits. The effect, Bell said, would be to make Telpak discounts available to all private-line users and cause a massive loss of revenue to the telephone company.

Telpak users then went to court and won continuation of the service — for existing customers only — pending last month's appeals court decision.

The court concluded that the FCC should have refused to let AT&T cancel Telpak, because the company failed to submit proper justification. But the court also gave AT&T another chance to meet this requirement.

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At Higher End of Price Scale

HP Model 250 Offers Outstanding Performance

By Hillel Segal

Providing excellent human engineering, an advanced Basic language capability and high standings in the benchmark testing program, the Hewlett-Packard Co. 250 small computer system is a "must see" product in its price and application range.

In benchmark testing commissioned by the Association of Computer Users (ACU), the HP 250 scored two first-place and two second-place finishes in the 12-system field of computers priced \$15,000 to \$25,000. A total of six tests were run.

Exact results of two of the applications tests are listed with the benchmark standings. All systems were tested by running standard programs written in Basic, where that language was available.

The 250 is priced in the upper one-fourth of that price range, selling for \$23,650 in the configuration tested. Basic is the only language offered. It is included in the hardware price along with a number of significant utility packages.

Terminal Features

One unique feature of the CRT terminal is the placement of "soft keys" immediately below the screen. Prompts appearing directly above on the screen label the function that the key controls, making use of the system very clear and trouble-free.

Computer operation is done by a pushbutton approach, with the software-driven key labels presenting only the control options available at the moment. Pressing a soft key begins an operation. When the operation is complete, new soft key labels appear on the screen. This greatly simplifies the user's problem of remembering "where to go from here" when using the system.

One user told us, "The human engineering of the keyboard and CRT is the best feature of the 250." The independent consulting firm which performed the benchmark testing agreed with users in the survey that the soft keys contributed significantly to ease of use.

Shining Performance

In its performance of the CPU and I/O tests, which measure the basic processing and file-handling capacities of a computer, the HP 250 really shined, taking first in the diskette-oriented I/O test and second in the number-crunching CPU test.

Add to this the first-place finish in the editing test, and you have to conclude that the basics are there — in spades.

The editing test compares all system editors with respect to ease of use. This comparison is done by starting with a nine-line file, changing it by using the edit functions into an interim form which contains errors, and then editing it back into the original error-free state.

The Hewlett-Packard 250 required 152 keystrokes to perform the test sequence, the lowest of any system tested in this price range. Other systems tested in the series required up to 248 keystrokes when performing the identical operation.

In real-life applications tests, how-

SCOREBOX

System: Hewlett-Packard 250
Current Price: \$23,650

BENCHMARK RESULTS

		TIME	RANKING
C-1	Scientific/-		
	Engineering Problem	4:05.9	2nd
C-3	Accounts Receivable	4:45.7	6th

OTHER BENCHMARK RESULTS

	C-1	C-3
IBM 5110	8th	4th
Wang 2200VP	1st	3rd
Texas Instruments FS 990/10	*	2nd
Hewlett-Packard System 45	3rd	8th
DEC PDP-11V03	7th	5th
Q1 Lite Microcomputer System	4th	7th
Univac BC/7 Model 610	5th	11th
Northern Telecom/Sycor 405	*	*
Datapoint 1170	9th	9th
Randal 100	6th	10th
Hewlett-Packard 250	2nd	6th
Texas Instruments DS 990 Model 2	To be covered next issue	

*Could not run because of memory or formatting limitations.

ever, the 250 could not maintain its edge. Its finishes in the scientific-engineering problem, new product development problem and accounts receivable problem ranged from second to sixth place.

The 250 ran third in the new product development problem, a real-life application test which models the relationship between production costs and

stations which are functionally identical may also be connected to the system, up to a maximum of five remotes. The same interface may be used to connect an HP 3000 computer system.

Utility Packages

Not tested in the benchmark studies were some items which are definitely worth mentioning: the utility software

This weekly column gives the highlights of benchmark tests conducted on popular small computer systems. The full reports were originally published by the Association of Computer Users, a 4,000-member nonprofit organization.

profitability over a four-year period for a hypothetical company. The test establishes a base line and varies several parameters in a "what if" mode.

Final display of the financial model created by this test includes items such as number of units sold, selling price, revenue, gross profits, net income and other factors of the imaginary financial situation created by the test.

The hardware configuration used during the benchmarking test series included a processor with 32K bytes of user memory (160K total), two diskette drives (2.4M bytes total), a 180 char./sec printer, the CRT, keyboard and console. Memory is expandable up to a maximum of 448K total for the system.

As many as three diskettes may be used, and up to two 19M-byte disk drives may be attached as well. Remote

packages included in the system.

Image, the data base management system, was universally praised by its users. This was especially true in small business applications. A collection of commands and programs, it provides the capability to create and control an information management system, including password protection.

A utility called Query allows access to the data base for update or retrieval. Forms provides capability for development and modification of customized forms, displaying them on the screen for data entry or print formatting. Report Writer is used to format reports, and Sort performs sorting functions while accessing a data base.

One user of the 250 commented, "I recommend the management software [Image] to everyone." Another said, "The key is software — there's plenty

of good hardware out there."

We would be the first to agree that hardware capabilities and test results are only part of the evaluation process. At least as important is the "comfort factor" a buyer feels with the vendor's support services.

So we listen very carefully as users in our interviews enlarge our awareness of the important services provided by the vendor. Increasingly, users are showing a growing sophistication in realizing that in many cases, as was said, "software is the key."

Such insight is a pleasure to share. Creating a process by which customers may communicate their experiences is the essence of a user evaluation study.

Hewlett-Packard Model 250 customers ranged in their comments from "very pleased" to "absolutely thrilled."

Many remarks included points about flexibility, highly advanced design, and fine human engineering. In particular, the data base software was given by several users as the number one factor in their decision to purchase a 250.

One customer told us, "The documentation is 20 times better than IBM's." Users reported that both Hewlett-Packard and its OEMs provide "A-1" supportive services in the areas of documentation, training and maintenance. These are critical services which are often the cause of customer dissatisfaction in the data processing field.

Price Factor

The one negative factor frequently noted — the price. Hewlett Packard's 250 is in the upper end of the \$15,000 to 25,000 range, and users must be convinced that the system is worth the extra cost.

For instance, the price of adding a remote station turns out to be quite high when all costs, including the interface, are considered. But those users who had opted for the HP 250 and were contacted during the survey evidently were satisfied with their decision.

Next week: we take a look at benchmark test results for the Texas Instruments, Inc. DS 990 Model 2.

About the Author

Hillel Segal is president of the Association of Computer Users (ACU), a nonprofit association with members all over the U.S., Canada and several other foreign countries.

One of the association's key activities is the publication of its "Benchmark Reports." Each month a new report is produced covering another computer system.

In addition, ACU publishes seven bi-monthly newsletters for users of small computers, midi computers, large computers, time-sharing systems, distributed processing systems, word processing systems and home and hobbyist computers.

A complete set of sample copies of each of ACU's newsletters and complete information about membership in ACU is available from the ACU at P.O. Box 9003, Boulder, Colo. 80301.

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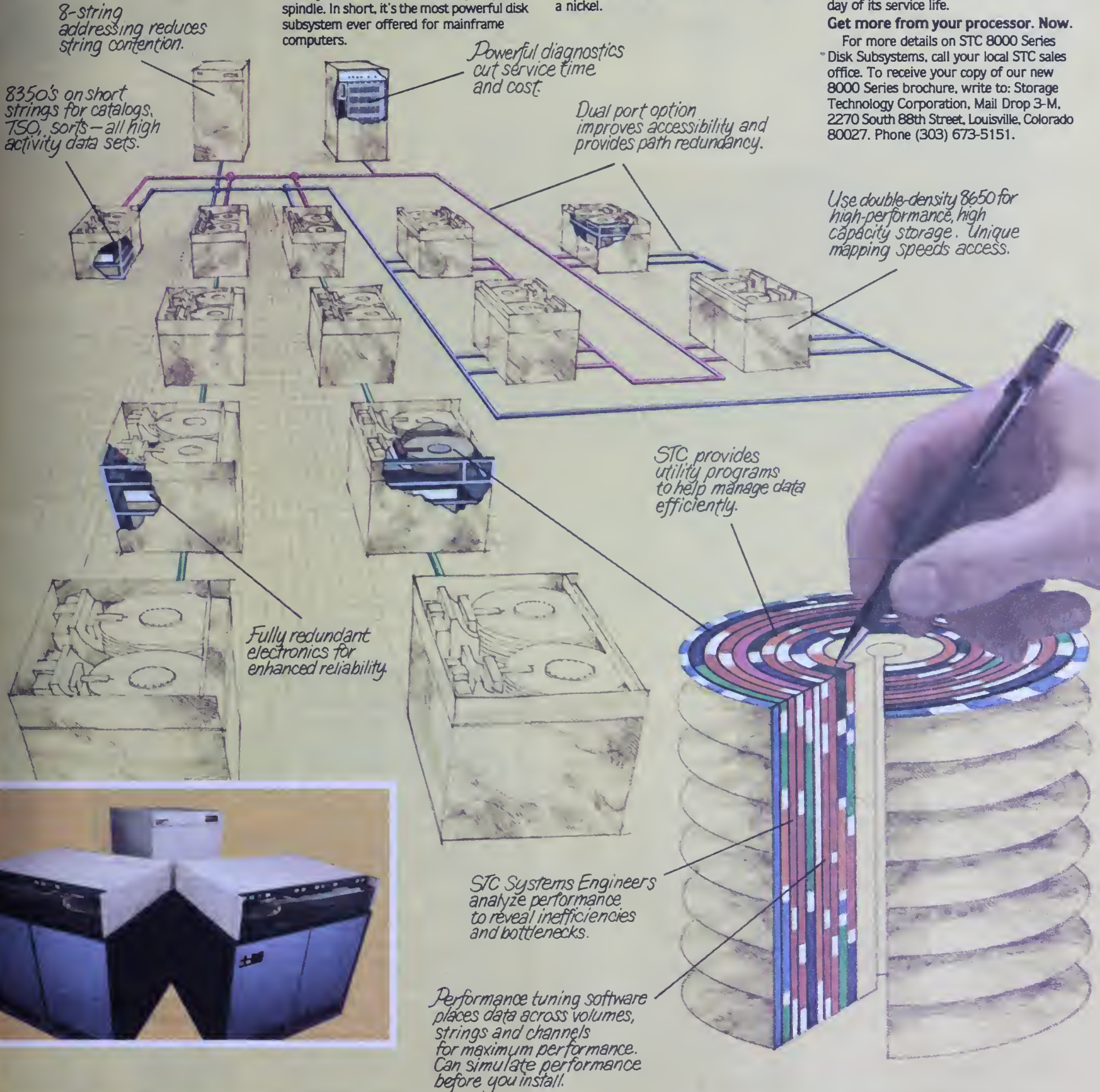
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Managers on the Move

JAMES E. NELLESSEN has been appointed director, group systems and procedures, and LEE WEINSENBERG has been named director, casualty systems development, at Bankers Life and Casualty, Chicago.

Nellessen will be responsible for developing and maintaining information systems. He formerly managed the group records division of Washington National Insurance Co. and Universal Oil Products.

Weisenberg was manager of casualty systems development before his promotion. Prior to joining Bankers he spent more than 13 years with the CNA Insurance Group.

He holds a B.S. in business administration from Roosevelt University, Chicago, and is a fellow of the Life Management Institute.

officer and most recently as DP project coordinator.

Hollosy also holds an M.B.A. from the University of Southern California.

JOHN S. JANDRAS has joined the Olsten Corp. as director of data pro-



Jandras



Anderson

ROBERT G. KRAMER has been promoted vice-president, Computer Operations Group, for Federal Express Corp. He will be responsible for daily operations including system software for the centers in Memphis, Tenn., and Colorado Springs, Colo.

Kramer joined Federal Express in 1978 as director of Computer Operations. He has previously held a similar position for four years with Levi Strauss in San Francisco.

He received a B.A. in economics from the University of Chicago in 1968 and an M.B.A. from Lake Forest College, Ill. in 1971.

cessing. He will be responsible for the data center at the company's headquarters in Westbury, N.Y., coordinating planning, design and implementation of all systems and programs and other related functions.

Jandras brings to Olsten a 20-year background in data processing, planning, organizing and directing for such corporations as Avis Rent-A-Car Systems, Inc., Consolidated Edison and Shell Oil.

The Olsten Corp. furnishes temporary personnel for general office needs, records, management, word processing, marketing and health care services.

GARWOOD HOLLOSY has been elected a vice-president of California Federal Savings and Loan Association in Los Angeles. He will be responsible for the design and implementation of new data processing systems for savings operations and loan services.

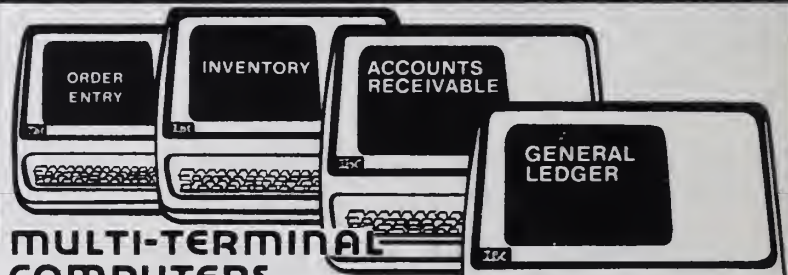
He joined California Federal in 1969 upon receiving his B.S. in business administration at California State University at Northridge. He has served as internal auditor, teller, loan service

WILLIAM A. ANDERSON has joined Westlands Bank in Santa Ana, Calif., as data processing administrator. He will supervise the bank's programming and computer operations for their escrow, bankruptcy and general ledger accounting systems.

Formerly vice-president and director of data processing at American Savings and Loan, Anderson specializes in applying systems engineering practices to business systems.

A graduate of the University of Mis-

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Managers on the Move

souri, he earned his M.S. in systems engineering from West Coast University at Los Angeles.

...

FRANCES D. SMYTH has been named as assistant vice-president in the electronic installations department of Metropolitan Life Insurance Co. In her expanded position, Smyth will still be responsible for software selection, installation and programming. She joined the company in 1974.

Smyth holds a B.S. in mathematics from Brooklyn Polytechnic Institute and an M.B.A. in management from Baruch College. She is also an assistant adjunct professor of management at New York University.

...

CHARLES E. JEANS and KATHRYN S. BENASHSKI have been elected assistant secretaries in the data processing systems department at the Hartford Insurance Group.

Jeans is an assistant director in information resource management systems division and is responsible for data processing support in property casualty lines and service actuariality. He joined the Hartford as a systems analyst in operations research support. He was promoted to manager of research service and then assistant director of that division.

Jeans holds a B.A. from Central Washington University and a M.B.A. from Trinity College.

Benashski is assistant director of actuarial services, responsible for EDP project management and daily editing and booking of premiums. She began as a programmer trainee and has held various technical and management positions.

Benashski holds a degree from the University of Wisconsin at Eau Claire.

...

FRANCIS X. MURPHY has been appointed deputy commissioner of management information for the County of Nassau, New York. He will be responsible for providing countywide data processing, communications,

printing/graphics and record/mail services.

Murphy joined the county in 1967 as a programmer trainee, where he advanced to his previous position of director of data processing in 1978.

Murphy holds an M.B.A. from Adelphi University in New York.

...

PETER J. LEONARD has been named director of management information systems for the Services Division of AM International in Schaumburg, Ill.

Leonard joined the corporation as a programmer analyst in 1972. He subsequently held various computer-related positions, most recently serving as the division's systems manager.



Jeans



Benashski

Leonard holds a B.S. degree in computer science from Boston College.

...

MICHAEL GARELIK has been appointed manager of information systems for the Society of Automotive

Engineers, Inc. Located in Warrendale, Pa., this organization is dedicated to educational and scientific advancement of automotive technology.

Garelik will direct the implementation of a new integrated management information system and office automation network that will require five years to install.

He was formerly a consulting psychologist at Psychological Consultants to Industry. Prior to that he was an assistant professor of psychology at the University of North Florida.

Garelik completed his doctoral studies at the Institute for Cognitive Studies, Rutgers University. He received his M.A. in psychology from the New School for Social Research, New York, in 1969.



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Houston to Host January Networks Meet

HOUSTON — The Communication Networks Conference & Exposition to be held here Jan. 13-15 will feature more than 70 sessions and 200 speakers from around the world.

Sponsored by The Conference Company, the program will emphasize an exchange of professional expertise between users, carriers, vendors and the regulatory and consulting communities. Attendees will also play a role in structuring the 1981 program. Some of the topics to be discussed include

network policy and management for U.S. and international users and carriers, network architecture, network software, satellite developments and information appliances for networks.

The registration fee is \$345 before Nov. 15 and \$395 after. Several full- and half-day Monday workshop sessions will be held. The full-day charge is \$195 and the half-day charge \$95. The Conference Co. said from 375 Cochituate Road, Rte. 30, Framingham, Mass. 01701.

Information Systems Award To Honor College Leaders

BOULDER, Colo. — Nominations are being sought for two awards to recognize "professional excellence and exemplary leadership in the field of higher education information systems," to be presented by Cause, an association "for development, use and management of information systems in higher education."

The Cause Award for Professional Excellence will be pre-

sented to the information systems professional who has made "a significant impact on the field of higher education information systems, or on the establishment and improvement of standards in the field, their institutions or the enhancement of their profession."

The Cause Award for Exemplary Leadership will be presented to the college or university administrator who has shown leadership in:

- Providing resources for improving information systems within an institution.
- Advocacy of information systems as an important part of higher education administration.
- Providing the necessary environment for the development of effective information systems within the institution.
- Significant efforts to make information systems more compatible with higher education administration.
- Significant contributions that, over a period of time, have enhanced higher education information systems within the institution and within the profession.

All Cause members have received a special announcement of the 1980 Recognition Program and a nomination form. The Recognition Committee will review all nominations and recommend the individuals to receive the awards to the Cause board of directors.

Nomination forms must be sent to Cause by Aug. 1, 1980. The two Cause awards, to be presented at the 1980 Cause National Conference in Phoenix Dec. 7-10, include \$1,000 scholarships in the awardee's name to the college fund of his choice.

Additional information is available from Cause's national office at 737 29th St., Boulder, Colo. 80303.



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Architect Overlooked CPU; Hospital Does Not

By Connie Winkler
CW Staff

STONY BROOK, N.Y. — It is the heartbeat of this hospital, but architects never anticipated that the computer would play such a key role in running the recently opened State University Hospital here.

Indeed, architects did not design a data center for the twin-tower, 19-story buildings, and the IBM 3031 at the last minute had to be squirreled away in what had been a storeroom in an adjacent building, recalled Frank A. Russo Jr., director of information systems and deputy director of the hospital.

It is particularly ironic because the computer and terminals do everything from admitting patients — even in the emergency room — to ordering blood tests. Later, the patient leaves the hospital with a copy of the computerized bill in hand.

Russo calls it the most comprehensive hospital system in the country.

Throughout the hospital are 130 IBM 3278 CRT terminals and 60 IBM 3287 printers. The system handles about 20,000 transactions daily.

Looking to 1990

"We wanted a hospital for the 1990s, not a takeoff on existing hospitals," Russo said about the days in 1977 when he, a consultant and the hospital director planned the university system.

Russo believes most hospitals today are five to 10 years behind their industrial counterparts in data processing, partly because they are afraid to give up their existing systems and partly because of the money crunch hospitals have experienced.

"We wanted a functionally complete, integrated system," he said. They shopped for software packages and settled on IBM's Patient Care System developed by Duke University. The purchase price was \$70,000.

It was one of the few instances when the software sold the hardware, Russo said. In going with the hospital package, the planners rejected using the Univac 1102 at the nearby computer center of the State University of New York, as had been planned originally. The hospital first leased the 3031, then purchased it when IBM cut prices in early 1980.

Depending on how the hardware evolves, the hospital could well go to a more distributed system, acknowledged Russo, who came to the hospital after heading Nassau County, N.Y.'s DP operation. At present, the hospital labo-

ratory already has an IBM Series/1 to collect data from such multichannel laboratory instruments as blood analyzers.

The hospital provides ambulatory care for Suffolk County, N.Y., and Russo looks forward to having a minicomputer at a county location.

In the data center, the hospital already has a Four Phase Systems, Inc. mini that is on-line to Shared Medical Services in King of Prussia, Pa., to handle all the hospital's financial applications. Eventually, the hospital will take over that financial processing.

On-Line Departments

Stony Brook is an organization where a visitor can walk into any department and find employees riveted to the terminal screens. "There's no other way to work here," Russo said.

On-line departments are radiology and nuclear medicine, respiratory therapy, dietary, central supply, laboratory, pharmacy, electrocardiograph, electroencephalograph, admit-

ting, emergency room, operating room, inpatient nursing and ambulatory care pavilion.

The computer system was rushed into place in order to have employees learn their jobs on the terminals by the time the hospital opened officially in February 1980. "We felt we had an opportunity with the opening of the hospital to overcome resistance to change," Russo said.

System Staffing

With only seven applications programmers, Russo started in October 1979 to build the data base and install the major systems.

The ease and flexibility with which the small staff was able to build their system using the Patient Care System is one reason Russo is so enthusiastic about the package.

The packages allow for easy debugging by the inexperienced staff and are flexible enough to allow for easy changes such as those often requested by health agencies. Blue Cross, the U.S. government and the state of New York all want the same data,

but each wants it in a different form. The package allows that flexibility, Russo emphasized.

"Being a state agency, we couldn't afford to have a large staff, nor could we afford to pay high salaries," he added.

The system, with its high-level report writer, makes it easy for users to adapt the 1,000 screens to their needs, and users make their own screen changes. The DP department contains only 25 people, and most of them are the 24-hour operations staff.

Physicians' Benefits

To make the system happen, Russo got good cooperation from the hospital staff, in-

cluding the physicians.

The physicians are happy so long as they don't believe that they are doing anyone else's job, Russo noted, and there are system advantages that make the doctor's job easier.

A printer in the doctor's lounge gives an immediate listing of the doctor's patients and their status so that the doctor does not have to find the respective charts at each nursing station before making rounds.

Russo estimated the cost of the system per patient at \$5/day and said the hospital will realize a net savings in labor of \$10 million throughout the next 10 years.



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As Shopping Guide Phone-In Directory Challenges Yellow Pages

By Jeffry Beeler

CW West Coast Bureau

SAN DIEGO — A computing system that the general public can "talk" to over the telephone is beginning to challenge Ma Bell's Yellow Pages as the preferred shopping guide for many southern California consumers here.

To an extent, the system —

dubbed the Consumers' Computer by its developer, Consumers' Computer Corp. of America — is a latter day Yellow Pages transferred from print to printed circuit boards.

The system contains advertisements for approximately 1,500 product and service classifications representing an estimated 1,000 area busi-

nesses. Cataloged in the system's 8,500-item advertising directory are goods and services ranging from autos to adoptions, from diamonds to do-it-yourself divorces.

Consumers interested in buying one or more of the advertised items can gain access to the system and its data base by dialing a standard seven-digit phone number on an ordinary Touch-Tone telephone.

System Advantages

Although the Consumers' Computer serves basically the same purpose as a standard Yellow Pages directory, it offers the buying public several advantages not available with hard-copy phone listings, according to Michael McCafferty, the firm's president.

First, it automatically supplies the name and phone number of the merchant nearest to the caller's current location. For example, if a prospective customer calls to inquire about 35mm cameras, the system searches its directory of photographic equipment suppliers and immediately tells which of the various stores is the shortest distance from the call's point of origin.

Furthermore, because the system's data files can be continually updated, the Consumers' Computer can automatically tell a caller whether a desired product or service is currently on sale.

To take advantage of the system, advertisers have to pay a monthly subscription fee. For consumers, however, the system costs nothing to use and is available 24 hours daily.

One executive responsible for the system's development describes the service as the "first free public computer network in the U.S."

In addition to serving as a clearinghouse for assorted product and service ads, the Consumers' Computer doubles as a personal calculator that users can operate remotely by pressing the right buttons on their Touch-Tone telephones.

By year's end, the system will also be used for forming car pools, performing metric conversions, relaying emergency phone calls from the speech- and hearing-impaired and providing many other free consumer services.

Sometimes referred to as the Product and Area Locator (PAL), the system was developed by the Consumers' Computer Corp. and first went into operation last January. For the moment, its scope of service is confined to the Greater San Diego area.

But efforts to franchise the operation are already well under way and within the next few months additional Consumers' Computer sites are expected to start appearing in major cities throughout the

U.S., according to the firm's spokesman.

The system here is currently configured around two mini-computers — an 8K-byte front-end communications processor and a 64K-byte host mainframe, McCafferty said.

The front-end machine controls the system's voice-response unit, multiplexes as many as 64 incoming phone calls, buffers message strings and sends them through an RS-232 interface to the host processor. There, the system searches its files, performs any related processing and sends the appropriate response back to the front-end processor, which in turn relays the message over phone lines to the waiting caller.

For competitive reasons, the firm declined to reveal the model numbers of the two minis other than to describe them as Zilog Corp. Z80-based units with a disk-storage capacity of 11M bytes, only half of which is currently in use.

To operate the system, users first enter a standard seven-digit code on their Touch-Tone telephones. The caller is then answered by a digitally recorded female voice that says, "Hello, this is Pal. May I help you?"

Comprehensive Directory

The callers then enter their Zip Codes, press a button and key in the four-digit identification number of the product or service they wish to order. Each of the system's 1,500 product and service classifications is assigned its own unique identification code, which is listed in a comprehensive 34-page directory, McCafferty said.

After the customers hit a specified key on their phones, the system searches the appropriate data file for the names of businesses that supply the goods and services whose identification numbers were entered earlier. The system then culls from that file the names of businesses that lie within the same Zip-Code area as the callers and, by using its voice-response capability, tells the customers by telephone which of these establishments is nearest.

If the type of supplier a customer needs does not exist within the caller's Zip-Code area, the system expands its file searches in ever-widening circles until it finally finds the name of a suitable establishment.

The system's "voice" then gives the caller the merchant's phone number and indicates whether a sale is currently under way for the product or service the customer wants to buy, McCafferty said.

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Probing the DP Psyche

By Barry A. Stevens

This profile of the DP personality emerged from psychological tests administered to 6,000 people over eight years. Can you see yourself?

Considerable talk has surfaced about the existence of a data processing mentality.

Gerald Weinberg, in *The Psychology of Computer Programming*, noted differences between the DPer and those he called "others." Philip Kraft, writing in *Programmers and Managers*, stated that "Programmers ... were different in ways that I could not quite understand." J. Daniel Couger, in a recent In Depth article in *Computerworld*, "What Motivates MIS Managers?", pointed to differences in personality between the management information services (MIS) manager and his peers. And whether or not you agree with all of Jack Stone's outspoken views on the DPer and his relationship to the business world, he too has pointed to observable differences between the DPer and others.

If a DP personality does exist and is observable in one form or another in large numbers of DPers, it probably has considerable impact on the industry as a whole. And if indeed it does, then it would be quite useful to understand the nature of that personality.

The source and nature of the material in this article cannot provide conclusive proof that such a mentality exists. But in an attempt to spur discussion, we will deal with the following questions:

- Is there a "DP mentality"?
- Is there a mechanism that creates it?
- What are some possible impacts on the DP work place?

In the following discussion, we attempt to describe that personality and explain the method by which its characteristics were observed. Shortcomings of the method as well as comments from several reviewers are presented. Then the profile is used to subjectively interpret common problem

situations found in many DP installations.

Finally, we suggest a more thorough study to derive such a profile and address the benefits that could accrue from a clear understanding of the DP personality.

General Profile

Use of generalizations for anything is risky, but the risk increases as they are used to describe people. People always object to such classification, especially if they are the subjects.

The profile described here may not match the view you have of yourself or of your friends and working associates. It merely describes observable differences among members of the group from which the observations were drawn. We make no value judgments, and none should be read into the material.

The DPer is more cool and impersonal than other personnel. He often prefers to be aloof when dealing with others, prefers to deal in precise terms and is often preoccupied with small details. (Users, on the other hand, are used to generic terms and prefer to avoid detail.) The DPer may be a limited communicator in the interpersonal sense.

The DPer tends to be very perceptive. He is intellectually curious, and has good problem-solving ability. His morale is high, providing that he is not working on what he perceives as routine or simple tasks. He may respond poorly to supervision or leadership he feels is mediocre.

The DPer tends to be more serious and reserved than his non-DP counterparts. He may be introspective and reserved, preferring to conceal his feelings. He makes choices that reflect conservative tastes and values. He also prefers stable life situations and pre-

fers not to take risks.

The DPer tends to be more persevering, even dogmatic. The DPer is reliable in assigned activities and prefers adherence to established practice. He may be inflexible in pursuit of a goal, but tends to be moralistic, driven by his conscience.

The DPer is often more cautious and hesitant than his non-DP counterparts. The DPer may be more shy and self-conscious and tries to steer clear of threatening situations. More likely than not, he harbors unrealistic feelings of personal inadequacy and prefers to avoid challenges on the personal front.

The DPer tends to be more pragmatic than non-DPers. He is used to dealing in tangible, concrete facts and thinking in conventional terms. Concerned with immediate issues and problems, he sometimes takes a narrow point of view. Short-range concerns are of interest, while long-range things are usually not. The time horizon of the DPer is shorter than that of his non-DP counterparts.

The DPer is unpretentious. He is more straightforward and to the point, preferring to be open, frank, candid, even blunt. He may lack empathy in dealing with others. Choices made on social questions show that the DPer may feel socially awkward.

The DPer is more anxious and uncertain. He may harbor unrealistic feelings of inadequacy and may be distracted by moods of defeat or failure. More often than not, he worries over past mistakes and seeks approval of others.

DPers taking the test made more conservative choices than non-DPers. They tended to stay with established ideas, customs or rituals. They rejected departure from tradition and stayed away from unorthodox practices.

The DPers observed were more group-active than non-DPers. DPers taking the test showed strong feelings for mutual dependency. They were joiners and were willing to be cooperative when group interests were at stake. They looked to others in getting things done and tended to value public opinion.

No Differences

There were a number of factors for which there was no difference observed between DPers and non-DPers:

- The degree of patience and stability shown.
- The extent to which the test taker was trusting or skeptical.
- Whether the test taker would act impulsively or in a self-disciplined manner.
- Whether the test taker was calm and relaxed or tense and restless.

Comments on Profile

This material was reviewed by a number of people before publication to get their reactions to the profile and comments drawn from it. Analysts and technical support personnel often singled out one aspect of the profile and said, "I'm not like that! That profile can't be right." Once the initial reactions subsided, other types of comments were documented.

Don Marchand, professor of public administration at the University of South Carolina, has been involved for some time with a project to determine the best way to provide DP services to state and local government agencies. He has reviewed the profile and used it in his work. "I've never seen anything that fits the DP people I've come into contact with so well. We've already used it to cool emotions, clear the air and understand the roles that are, or

(Continued on Page 26)

IN DEPTH

About the Test

Gerry Richardson, an industrial psychologist from Denver, used the test upon which these findings are based as a tool during a course on improving communications between DP and non-DP personnel.

The test was composed of 200 multiple-choice questions, designed to probe various personal characteristics of the persons taking it.

Richardson administered the test to approximately 6,000 people over an eight-year period. Roughly half were DPs and half were "others." All tended to be in middle to lower management positions.

The test takers recorded their preferences or most probable action for the situation described in each question. Sample questions included the following:

- I find it easy to mingle among people at social gatherings.
 - a) true
 - b) uncertain
 - c) false
- When diplomacy and persuasion are needed to get people moving, I am generally asked to do it.
 - a) true
 - b) uncertain
 - c) false
- On a project, I would rather work
 - a) in committee.
 - b) uncertain.
 - c) alone.
- If a heated argument developed

between other members taking part in a group discussion, I would

- a) like to see a "winner."
- b) in between.
- c) like it to be smoothed over.
- Talk with ordinary, habit-bound, conventional people
 - a) is often interesting and has a lot to it.
 - b) in between.
 - c) annoys me because it deals with trifles and lacks depth.

Responses were recorded in 16 categories including the following: the ability or desire to communicate effectively; the desire to work alone or in a group; aggressive behavior; self-discipline; creativity; patience; enthusiasm; conservative or liberal choices in life situations; self-confidence.

The purpose of the test was to contrast a student's self-image with reality. As such, Richardson did not retain all profiles, since that could make the students distrustful and affect their answers.

To further complicate things, background information was not kept, and control and test groups were not established. Richardson did keep notes, however, on the characteristics distinguishing DPs from non-DPs. It is from those notes and a small number of retained questionnaires that this profile was developed.

(Continued from Page 25)

should be, played between DP and its users," he said.

Several reviewers noted apparent contradictions in the profile. The DPer's preference to be aloof when dealing with others contrasts with his desire to be part of a group. Others contrasted his intellectual curiosity with the preference to stay with established ideas and practices.

Richardson noted from his observations that "it is likely that there may be contradictory elements built into the DP personality. Intellectual curiosity, for example, which would normally lead to exploration of new ideas, is balanced by caution, by a fear of changes that would result in risk or personal challenges."

Fears, Anxieties

Others have noticed fears and anxieties among DP personnel. Dr. Sammy Pearson, assistant to the administrator at the General Services Administration's Office of Planning and Analysis, has recently completed projects involving use of tests to measure user satisfaction in the DP environment. During his work, he has come into contact with large numbers of DP personnel, and he commented on the "anxiety, uncertainty and unrealistic feelings of inadequacy" in review notes on the profile: "I think that this 'trait,' if common (and I believe

that it is), is the single most important aspect of the profile. Fear of being inadequate (or of being discovered to be inadequate) could be the dominant characteristic [of the DP personality]."

Pearson noted several contributing factors. DP jobs have stringent requirements for success. Many pieces have to be exactly in place for a system to work at all. He also described the almost total lack of positive feedback he observed while studying DP environments. And he noted that the field of knowledge in DP is so vast that no one person can truly be expert in most of it.

The rapid growth of knowledge and the need for attention to ever-increasing amounts of detail in order to be successful may be strong contributing factors to this personality trait.

One reviewer commented on the DPer's profile in relation to other disciplines. John Dratch, national DP operations manager for J.C. Penney, noted that "any technically trained group working under stress may exhibit similar characteristics. Engineers, for example, may fit parts of the profile."

But he also said, "The pressures on data processing may be unique. DP is always in a confrontation mode and is usually seen as tearing down empires" that others have created.

Dratch's view is supported by Jagdish Dalal, MIS manager for

Brookhaven National Laboratory, who wrote in the *Journal of Systems Management* that "in some cases a change is perceived as a possible threat that will make the empire tumble or will lead to a loss of status and identity." And the author noted such a confrontation atmosphere when implementing change within the DP environment as well.

Personality's Origins

One doesn't have to observe DP hiring activities for very long to discover that people from all backgrounds and disciplines try to get into DP. And labor is so tight in some areas that almost anyone with any talent can be hired at the entry level. If the profile of those who remain is measurably different from the "others," it is reasonable to assume that something may have caused that difference. We will describe three possible causes.

Aptitude tests are often used to identify programmer candidates with high potential. In theory, the tests can't be used in making the decision to hire an employee. But a particularly high or low score on those tests can easily bias the interviewer or manager toward or away from a particular candidate.

The tests are constructed by observing large numbers of people already involved in DP, and the tests yield higher scores for those candidates who most closely approximate the characteristics of the DPs. The result could be to screen out those farthest from matching the characteristics of the group used to make up the test.

Situations in which employees help recruit personal friends or former business associates may contribute to creating a DP personality. An employee is likely to recommend someone who is compatible, perhaps a friend. Unlike in the physical world, where opposites attract, in this situation likes attract. Again, this results in increasing numbers of people with similar characteristics.

But standardized programmer tests are not routinely used at all computer installations; and personal references could not be expected to create a homogeneous set of personality traits among people hired, since the group of people doing the recommending is not homogeneous.

Neither mechanism could adequately explain an industrywide personality, if it can be agreed that one exists. However, a third mechanism, rooted in the characteristics of the industry itself, could provide an answer.

Question of Speed

The DP industry is often characterized as fast-paced. New products and technologies are constantly emerging. Pearson and Kraft both observed the rapid growth of knowledge and the necessity to master ever-increasing levels of detail.

Although there have been moves toward systematic approaches to management, most installations still run in a day-to-day crisis mode. Politics abound, both between DP and its users and within the DP organization itself.

Dratch and Dalal pointed out the "unique pressures" that operate in the DP environment. Job descriptions change as a function of all-too-frequent reorganization and shifts in technology.

The rate of information growth, the increasing level of detail, the increase in confrontation as DP penetrates deeper and deeper into the business world and constant crisis-mode management can all combine to weed out those who don't like or can't tolerate the fast-paced, stressful environment. This is a screening mechanism that could create a clearly identifiable DP personality.

Some Interpretations

In this section, we present some subjective interpretations based on the profile. The assumption is, of course, that there is some measure of truth in the profile, and most reviewers have agreed. The purpose is to present one view of how elements of the profile could combine to enhance, perhaps even create, some characteristics of the DP industry that many have seen and commented upon.

DPer-User Gap

Relations between DP and users have been described by many as strained, political, even hostile. The author, in the role of consultant, has been in dozens of organizations where the story is similar. Users complain about systems that do not meet requirements, projects that have fallen behind or poor operational service levels. DP complains about the fork-tongued users, who say they want one thing, then change and want another. The DP group often spends a great deal of time trying to protect itself against changing priorities, ambiguous requirements or politics. And we have all read numerous articles telling us to communicate in user terminology if we really want to get our ideas across.

Using phrases drawn from the profile, the DPer may be described as "often preferring to be aloof, used to dealing in precise terms" and one who may become "preoccupied with small details." The DPer prefers to avoid risks and personal (as opposed to professional) challenge. He or she may "harbor unrealistic feelings of personal inadequacy."

Since the profile was created by observing two major groups — and the groups were drawn from seminars of DPs and people who use DP services — we'll assume that the characteristics of the users are the flip side of those for the DPs. Richardson noted, for example, that the users are function-oriented, rather than detail-oriented. They try to avoid detail, are even repelled by it.

When users ask a simple question such as "What happened to my job?" or "Why is that report wrong?" they expect a functional answer, in as little detail as possible. The DPer can interpret the question as a personal challenge or, as the profile argues and

(Continued on Page 28)

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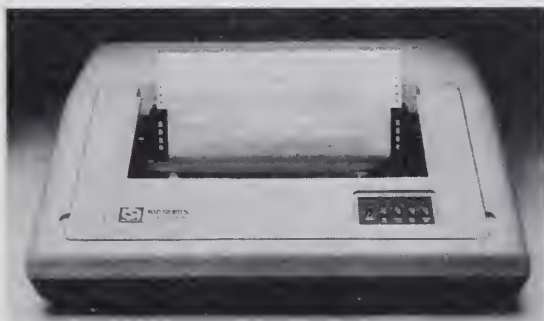
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IN DEPTH

(Continued from Page 26)

Pearson reinforces, become fearful that their inadequacy will be discovered. They communicate the answer in precise detail, in concrete terms, in an aloof manner, perhaps a bit defensively.

The user, repelled by detail, backs away from the transaction. The DPer, viewing that backing away as a personal challenge, defends the detail still more vigorously and finally backs away from the transaction as well.

Here we see two groups of people who must work well together to accomplish what they both have been assigned to do. And each has a psychological stake in *not* working closely with the other. The result is a gap across which effective communication and functional contact are difficult.

Manager-DPer Gap

Managers at middle and upper levels in DP organizations often feel a gap exists between themselves and the peo-

ple they manage. One operations manager in a large shop told the author, "It's frustrating to try to get my people to do what the company wants done. Sometimes I feel I can't control them at all." A DP director said, "I try to translate the corporation's objectives into a technical challenge substantial enough to hold my people's interest. If I fail, I lose some of the better ones to companies that can provide that challenge." A third manager said, "I've made my people follow standards and

good project management practices, but only at the price of resentment, lowered morale and some turnover. During an exit interview, one employee told me that I just don't understand the technology or the real problems that the DP group faces."

The profile shows DPer is used to precise terms and small details. Morale is likely to be high unless he is working on tasks perceived to be simple or routine. His response to leadership can be poor if he sees it as mediocre. Short-range topics are of interest to him, and the long-range picture is not.

The manager's role, of course, is to worry about long-range topics — long-term problem resolution, planning, budgets and projects that will not even be begun for a year or two. Obviously, projects that far in the future cannot be specified in complete detail.

The manager cannot be expected to gain a detailed understanding of every aspect of every DPer's work. This can cause the DPer to view the manager as mediocre and to reject his or her authority. (The systems programmer in the exit interview described above told the author "that guy can't even do a Sysgen. He's not going to tell me how to do my job." The rejection of authority is usually not, of course, overt: "How can I commit to that plan if I don't know the details?"

Lack of detail as well as concentration on long-range topics — basic characteristics of the managerial process — can combine with the profile characteristics of the DPer to create a gap between the DPer and manager.

Loyalty to Profession

The question of the DPer's relationship to his profession and to his employer has been raised before. As only one example, Ira Gottfried, president of Gottfried Consultants, Inc., noted in comments reported in CW [March 31] that, among other things, DPers are "less loyal to their employers than to their profession."

The profile was used above to describe gaps that could develop between the DPer and user and between the DPer and manager. Other characteristics described in the profile suggested that the DPer is anxious, uncertain and may value public opinion. He doesn't want to be a party to failure and prefers to stay with established ideas.

Professional associations and meetings are among the best sources of established ideas in the industry, and such meetings gather people in non-threatening situations to talk about those ideas. DPers who bring home ideas from those meetings are backed up, in effect, by the collective weight of those attending the meeting.

The sessions are conducted at the level of detail needed by the attendees and in language appropriate to their functions. Those who present papers or participate in formal or informal discussions get considerable positive feedback. (Pearson noted the almost total absence of positive feedback within the DP organization. Couger noted that problem is "perceived at all

If Churchill had used SPSS®, he might have saved his statistical department a lot of blood, sweat and tears



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As a matter of fact, Churchill might have been able to do it on his own, without the Department, because SPSS is so easy to use. Churchill himself could have learned from the excellent SPSS self-teaching manual. No special training in computer language would have been necessary—SPSS talks, listens and reports in the user's language: plain English!

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points of the organizational hierarchy" and went on to say that "the feedback problem . . . may be caused by the unique characteristics of personnel in the computer field.")

Further, the ideas of individuals in the field are not held in very high regard. Ideas or approaches to problems are always backed by some authority from "the industry." How often have we all heard, "IBM suggests doing it this way . . ." or "The institute approach is . . ." or "American Airlines says . . .?"

The industry can provide much-needed positive feedback and act as a source of proven successful ideas, minimizing risk and personal challenge for the DPer when he returns home to try out those ideas. When things don't work out at the DPer's organization, industry groups can provide leads to another job. These factors, together with the gaps described above, can combine to make the DPer more loyal to the industry than to any one employer.

Standards, Project Management

What manager has not encountered difficulties in trying to implement or enforce standards and project management? Their beneficial effects are well known. They offer the potential of better-quality work and better overall DP performance. But in spite of the benefits, extreme resistance is often encountered in their implementation or use.

The profile shows the DPer to be skillful in problem-solving and happier with tasks that are not perceived as simple or routine. And short-term projects or tasks are the DPer's favorite concern. There is a clear, almost dogmatic focus on completing such tasks. (And Weinberg noted also that the DPer is very accomplished at pushing a specific project or task through to a conclusion.)

The profile also shows that the DPer may reject things which come through the management chain, since that chain can be perceived as mediocre, as described above.

Standards and project management can be seen as roadblocks in the way of getting the job done. They require that time be spent in meetings and filling out paperwork. And they limit the range of choices available in solving a particular problem for a particular project.

They get in the way of the DPer's basic preference for completing the task at hand as soon as possible, and they

prevent the use of shortcuts that could allow earlier completion. They often prevent the use of novel or innovative solutions to problems the DPer is able to devise. Standards and project management are the work of the managers, and they, as with the managers themselves, may be perceived as mediocre.

What Next?

This article has attempted to show how a personality profile of the DPer might be constructed using a standard test. In addition, it has demonstrated some of the many possible impacts of that profile on the DP industry.

Additional work in verifying or expanding this profile, or in creating another like it, would be very useful. The test conditions should be better controlled and more information collected on the test taker's background, experience, position and organization level.

But why bother? What benefits could result? Richardson has already used the material in its present form to structure a very effective seminar designed to improve communication between DP and its users. Marchand has also used the material in its present form to confirm findings in his work.

Additional testing could remove any doubts about the validity of the effort and provide additional detail useful in many different areas. Courses in effective communication, for example, usually include one cardinal rule — know your audience. The profile can provide another important tool in gaining that knowledge. It has marketing implications, since it presumably defines the basic personality of "the average DPer" with whom many marketing campaigns attempt to communicate.

The profile is also very useful as an introduction to the DPer's personality for personnel who have never previously been exposed. And understanding the profile as it relates to users and managers can give the DPer an edge as well. Kraft indirectly touched on this when he wrote: " . . . something struck me with particular force. Most programmers seemed to know well enough how their jobs were organized, at least insofar as knowing means that they possessed most of the information. They had little in the way of an overall perspective . . ."

"It was apparent that managers and their employers knew something that programmers didn't know. It was also apparent that because of this, managers were in a position to exert a degree of influence that was not — and could not be — balanced."

Better understanding of this profile would help in improving communications between DP and its users and between managers and their employees. It can aid in marketing efforts. And it

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can aid in restoring a balance that Kraft says is missing, by providing the DPer with a better understanding of the roles and relationships in his organization.

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Barry A. Stevens is principal consultant for Performance Management Associates, Inc. (PMA) in Scottsdale, Ariz. PMA provides consulting services, seminars and software products to improve productivity in a wide range of applications.

With 15 years' experience, Stevens has seen DP from the viewpoints of the vendor representative, operational management, a public accounting firm and as an independent consultant.

He is the creator of the methodology

for DP management documented in Volume 1 of the EDP Performance Management Handbook, published by Applied Computer Research, Phoenix, Ariz. He has served as associate editor of the EDP Performance Review, was president and director of the Computer Measurement Group, has been active in Share and is a member of the Association for Systems Management.

Stevens holds a bachelor's degree in electrical engineering from the University of Connecticut.

EDITORIAL

Time Bomb

The Federal Aviation Administration (FAA) is playing with a time bomb that could explode at any moment in the form of a mid-air collision.

While the agency continues to deny charges that the nation's air traffic control (ATC) system is obsolete, computer outages around the country have caused countless traffic delays and at least one near mid-air collision recently [CW, July 14].

At outage-plagued O'Hare International Airport in Chicago, a data systems specialist speculated recently that one of the system's problems could be its age: "My own opinion is that when the software was designed in the early 1960s, perhaps the person that was looking down the road 20 years just didn't realize the potential was there for saturation."

In recent years, aviation industry observers have repeatedly blamed just such lack of FAA foresight for the ATC system's increasing problems, both in software and hardware.

The present ATC system is based on World War II vintage radar and aging first-generation IBM 9020 mainframes, while air traffic itself — and thus the load the computers must bear — continues to increase yearly.

While the U.S. air transport industry carried 174 million passengers in 1970, that figure increased 60% by 1978, to 280 million. And most forecasts predict the number of passengers will increase to more than 500 million by 1990.

Current FAA plans call for an updated ATC computer system by the end of the decade, but according to recent congressional testimony, the number of near mid-air collisions has already increased more than 83% from 1973 to 1978.

Increasing ATC computer outages — many the result of memory overload — can only compound the danger to air passengers.

Besides near-misses and the inconvenience of delays caused by computer outages, the cost of air traffic delays to the industry is estimated to be more than \$500 million a year in terms of wasted fuel and lost operational efficiency.

And while such delays do not in themselves create unsafe situations, they nevertheless increase passengers' exposure to unexpected occurrences that could affect safety.

The FAA should stop wasting its energy on denials and start restructuring the ATC system with the safety of its passengers foremost in its mind.

DATA PAST

Five Years Ago July 23, 1975

WHITE PLAINS, N.Y. — IBM announced the 3344 and 3350 fixed disk drives for the 370/135 and larger systems. For a 3340 user, the 3344 drive would effectively halve the storage cost per byte; for a 3330 user, the 3350 would cut per-byte storage costs by 50% to 70%.

— — —
A majority of women DPer's had never met any sexual discrimination and felt competence had become the deciding factor in obtaining promotions, a *Computerworld* survey found. Respondents to the survey were nearly unanimous in crediting the feminist movement with recent improvements in their situation.

Eight Years Ago July 26, 1972

MONTVALE, N.J. — The Fall Joint Computer Conference would be the last of its kind, the American Federation of Information Processing Societies (Afips) announced. The first National Computer Conference was being planned for June 4-8, 1973 at the New York Coliseum. The NCC would supersede the spring and fall joint conferences.

— — —
WASHINGTON, D.C. — The government found a new use for the Social Security number. As of July 1, it also became the Taxpayer Identification (TID) number, and all banks were required to use it to facilitate record retrieval.

LETTERS

Against IBM Breakup

Let me be counted among the strong opponents of the stated position of Martin Goetz, vice-president of Applied Data Research, Inc. [CW, July 7]. His call for "structural relief" and a breakup of IBM would not serve to remedy any of the problems facing independent software suppliers or their customers in the 1980s. Pansophic Systems, Inc. is a member of the Association of Data Processing Service Organizations (Adapso) and I can perceive no "grassroots" support for this position there.

Goetz stated that "any attempt to restructure IBM . . . would probably sit poorly with many of the company's customers . . ." I should say so! Such a move would probably cause an overnight halt in the impressive record of technological advancement achieved by the computer industry since the mid-1950s. There would suddenly exist an immense vacuum since no organization (other than IBM) could satisfy the immense worldwide demand for computer equipment, software and services for many years to come.

Goetz failed to consider that the computer users would be hurt most by his proposals for breakup of IBM. I fail to see how such a drastic move could ever result in "improved software quality and reduced software prices." In fact, it would clearly cost more to produce better quality software since it is labor-intensive.

It is also a fact that most IBM software products are very low priced because of its large volume of potential users. Clearly, software prices can only increase (even without a breakup of IBM).

Joseph A. Piscopo
Chief Executive Officer

Pansophic Systems, Inc.
Oak Brook, Ill.

More on Series/1 Cobol

Please add our comments to those of Robert Moreau regarding the Series/1 EDX Cobol [CW, June 9; Taylor Report, May 19]. Our company has been working with the EDX Cobol system for approximately one year. We have developed several software packages using the EDX Cobol, including a commodity brokerage management system, a securities brokerage management system, a common carrier accounting system and a general accounting system.

As Moreau indicated, the debugging time in Series/1 EDX Cobol was more extensive than we anticipated. However, we agree this system is possibly the General Systems Division's finest. Response time and general performance are better than we had hoped.

However, local IBM support in initial debugging, especially in the interface to Cobol, was less than helpful. We felt as if we were pioneering in the system.

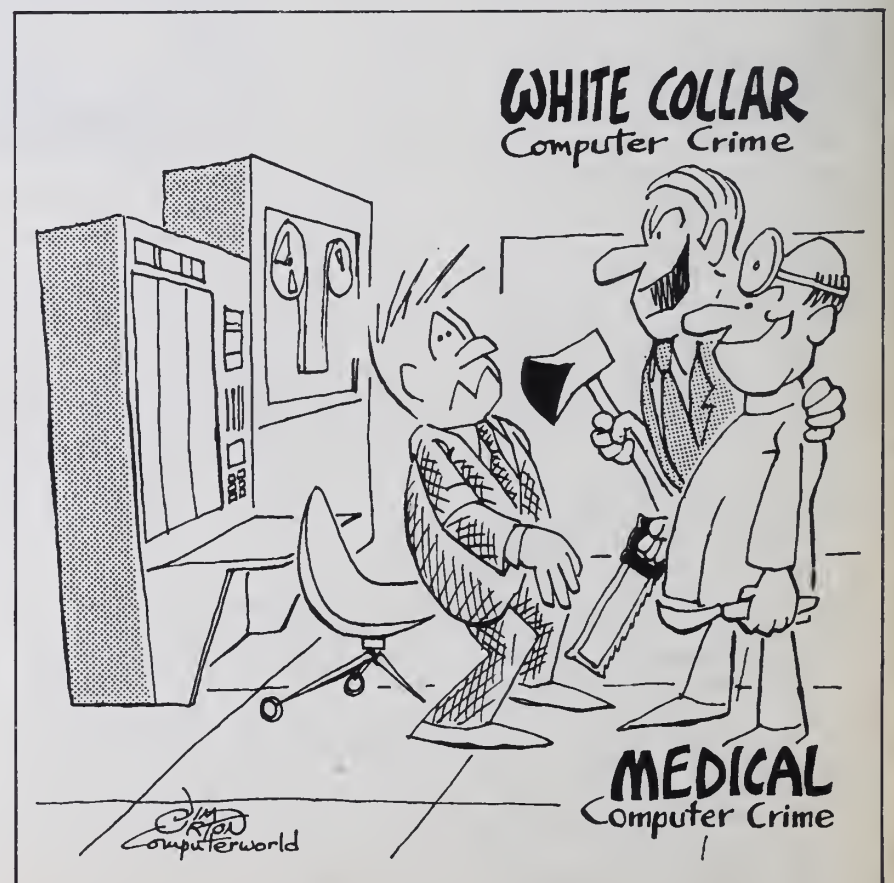
Regarding the Series/1 hardware, we are impressed with price and reliability. We have been using Control Data Corp. peripherals on our Series/1 and find the equipment performs well and is less expensive than comparable IBM equipment. We have found the IBM 4979 display stations' performance quite unsatisfactory. The CDC 80610, on the other hand, is an excellent performer.

We have spent many hours developing our own software to interface the EDX with the Cobol. One of the routines we developed is the Cobol/-Image interface. This routine allows the user to use the full screen under Image in the Cobol programs.

We are always pleased to read of developments in the Series/1.

Ben Pratt
General Manager

Idaho Computer Service
Twin Falls, Idaho



'How's about a hearty welcome aboard for my new partner Doc?'

READER COMMENTARY/Michael Gershman

Zeroing In on a Better Job

As a manager who has interviewed quite a few programmers seeking employment at Citibank, I have reached a few conclusions concerning how a professional can help himself get the best job offers.

The hardest job to get is the first one after school. The most marketable trainee is one who knows a widely used programming language on a practical level. Don't expect your teachers to go into this kind of detail; if they wanted to deal in vocational training, they wouldn't be college professors.

The solution is to buy the necessary manuals at least a year before you graduate and make it your business to learn, on your own time, as much as possible about the nuts-and-bolts details of a widely used programming language and computer. If you can actually study working programs written for that computer, or even write and

run a few, so much the better.

Instructor-coded JCL, macros and I/O declarations are fine for running programs that play Hexapawn or simulate psychotic chimpanzees. However, a cover-to-cover knowledge of the IBM VS Cobol Reference Manual for OS/VS (GC26-3857) and the IBM OS/VS Cobol Programmer's Guide (SC28-6483) will complement your academic studies to get you the job and salary of a working programmer while your classmates are competing for trainee slots.

There may come a time when your knowledge of computability theory and system architectures will advance you professionally beyond your less-learned colleagues, but years of practical experience are needed to develop the mature judgment with which to apply your theoretical knowledge. Meanwhile, as a famous performer once noted, "Rich is better."

The working professional seeking a position at a new company doing the same basic job will seldom have a problem improving his salary and even his title. Nonetheless, some applicants do consistently better than others at getting the jobs they want. First of all, be clear in your own mind as to why you are moving. If you cannot give a logical reason for leaving, your prospective employer will have little basis for determining whether you will stay any longer at his company.

Second, know what you are looking for. If you would like to further your specialization in IMS or Tcam/NCP, say so on your resume and at every discussion with agencies and employers. It is your job to plot and follow your chosen career path.

Finally, don't limit your learning to the bare minimum needed to get today's program written. The fact that

you read *Computerworld* is a good sign. Read some of a computer journal and the description of one new language instruction, JCL parameter or software function every week, and not only will you get the better job offer, but you will get a better assignment once you are hired.

Entering Management

The last stage in many programmers' careers is breaking into management. There seem to be three main reasons programmers go into management. Some recognize they can achieve more by directing others than they ever can by personal efforts. Others find their technical ability has peaked, and they would like to be measured on their people skills. Still others are attracted by the reputed money, power and glamour of management.

Whatever the motivation, there are three basic approaches to getting a management slot. You can simply be promoted into a new or vacated management position in your own group, you can actively seek out a job in your own company or you can emphasize the management aspects of your resume and apply for a management job elsewhere.

There are a few problems with the last method. A thousand other people compete for every management job open for outside hires, and many of the other folks have already been managers for years. What is more likely is that you will be hired for your technical expertise but given a management

(Continued on Page 32)

THE TAYLOR REPORT/Alan Taylor

Forth Entering Cobol Territory

The advance of the Forth language into commercial use is being given a major test in Cedar Rapids, Iowa. Here some IBM Series/1 EDL banking applications are being replaced and augmented by Forth-based Source Data Language (SDL) applications that use no operating system. The applications and, earlier, the SDL language itself were developed on Honeywell, Inc. Level 6 minis by a local firm, Source Data Systems (SDS).

It is expected that the use of SDL will give freedom from the IBM EDL software and permit prompt updating of the interactive and data base programs by users — with little or no programmer assistance. And if it all comes off as planned, commercial users will have a new weapon to assist them in their fight to improve computer productivity.

The key to this development is the Forth language. Forth — both from Forth, Inc. and from the independent Forth Interest Group — has been described here a number of times. Started in the field of radio astronomy, it is a compact, independent language that has been implemented on many systems, mainly minis and micros.

The important thing about Forth is its extensibility. That is, a procedure such as TAKE THE HIGHER can be defined in terms of more primitive actions, such as COMPARE, ADD and so forth. Then, once this definition has been included in a program, it becomes quite economically a full part of the available programming language.

Avoiding Standard Problems

This extensibility works both upward, into application-oriented forms, and downward into peripheral drivers and microcode elements. So theoretically, a Forth user can achieve the same freedom from hardware that a Cobol user has — but without being restrained by dictates as to what the upper, application-level software looks

like.

Many Forth users, particularly in the dedicated application areas, have objected to any attempt to limit what the language can do. But SDS's president, Bob Barnett, an ex-Collins Radio systems man with hospital systems experience, believes in a different approach. He believes in restricting the system so that it becomes safe for non-Forth programmers — and even users on occasion — to update the application.

At the same time, his approach is to change the lower primitives to fit new sets of hardware as the market requires — without having any impact on the upper areas. And both of these procedures — in the upper, application area and the lower, hardware area — are now being tested simultaneously in the Banks of Iowa Computer Services operation, a rather sophisticated user handling more than 100 banks.

The hardware transportability test is, short of surprises, already over the hump and apparently successful. Barnett had a Forth, Inc. technician adapt the language to Series/1 from the Honeywell Level 6, and this was completed in June.

The new version of the Banks of Iowa application was reprogrammed into the proprietary SDL code at the same time, and the joint product — the Series/1 interface, SDL written in Forth and the bank applications written in SDL — was successfully mounted early this month. File conversion, development of written procedures and so forth will all take time but are coming along.

The simultaneous software testing, while necessary, can be assumed to be successful already — just as it really isn't necessary to test every Cobol application once the compiler has passed the U.S. tests. The same language is in use on Level 6 minis at Iowa National Mutual Assurance (Inma), where it is being used to add intelligence and data base access for branch processing of

insurance policies.

SDL is now working at Inma, right at the user level. And the application is not static. Modifications are taking place in minutes, and the testing is being done when the department wants.

Inma is so pleased with the language

(Continued on Page 32)

HUMAN CONNECTION/Jack Stone

Technology Gains Suggest New Training Guidelines

"So what you are saying, then, is that the training of end users in data processing concepts is considerably more effective when presented in the environment of the user's own computing machinery and applications software. Is that right?"

I was slightly embarrassed by this remark because the questioner, with only a few words, captured the essence of the paper that took me 30 minutes to present. (The event was the Annual Computer Personnel Research Conference, sponsored by the Association for Computing Machinery's [ACM] special interest group in the area [Sigcpr], and the title of the paper was "Systems Training for the User Executive.") So I felt challenged to use this column to see if I could be equally concise in offering some final guidelines for user training.

• **Learning Needs.** The unvarnished truth is that the vast majority of end users really do view computers only as tools to handle their data processing needs more easily, just as they view cars as tools to facilitate their transportation needs. As such, their interest in computer systems training extends only to understanding as quickly as possible what the machines can do for

them and how they can operate them. Their interest level parallels that of the average citizen in driver education.

This is not to say that users shouldn't learn programming concepts or the elements of the systems development

This is the last article in a series on concepts training.

process. But they need to learn only the minimum amount to handle their job responsibilities.

• **Hands-On Training.** Lectures are wonderful, but only when the audience consists of systems types who can assimilate the high-volume, real-time data delivery. These attendees are the same kinds of people who don't want hands-on instruction for fear it will "slow them down." Users don't often say it, but they positively hate lectures from members of the computer department because the presentations usually employ an undefined vocabulary and cover intricate details in too short a period of time to permit decent understanding.

(Continued on Page 32)

Smoothing the Way Toward a Better Job

(Continued from Page 31)

title. Since you have never been a pure manager, you will have a hard time telling the difference until you are working at your new job and find your boss making all the important decisions about your people's careers and making sure they know it.

Other Problems

This is not all bad, for there are other problems with being hired from outside into your first real management

slot. Management is politics, and you probably don't have the background to fight for your people and your department in a company where you don't know the ropes, the rules or the contacts. Management is people-oriented and the people will all be strangers to you.

Management requires delegation, and the fact that your new company hired a first-line manager from outside tells you how many of your people can help you without themselves being trained

in management. Finally, management requires making firm commitments and irrevocable decisions with incomplete data, and as a newcomer you will have less data than your colleagues.

I realize that sometimes you simply cannot move up in your present company. All is not lost. It is easy enough for a top-notch programmer to land a titular management job. Be sure you will have a few real (not matrixed) subordinates, regular contact with your boss's peers without his always being present and entree to the management-level staff meetings.

Clarify Intentions

During the interview, make it clear that you intend to move into a true management career path. If the company needs technical managers, this will help your new boss give you the right assignments and guidance. If your prospective boss is insecure or overloaded with potential managers, you are better off elsewhere.

Finally, a word about locating jobs. There are three primary routes for finding a new job: personal contacts, direct application and employment agencies (however designated).

If a friend of yours knows of a desirable opening in his company, by all means apply. This route is particularly valuable when you are applying for a job that will stretch your documented abilities in a new direction. It will also probably help your friend in his own career, a point to consider in evaluating his description of the job.

If you read an article or ad in *Computerworld* about a major corporation

that seems to fit your work style, or a high-technology company working on a project you'd love to get involved in, you should write directly to the manager of the project that interests you or the professional recruiting office at corporate headquarters (your library has the addresses).

Cover Letters

In addition to your resume, include a one-page cover letter explaining why you want to work there and why your knowledge and experience is useful to that particular company. This approach will often get a department head to open up a job requisition just to bring you into his group.

The most frequently used route for changing jobs is the employment agency, head hunter, school employment office or whatever. These people should know what companies are hiring, for what skills and at what salaries. They should be willing to check with you before mailing your resume to each company and to give you honest feedback if an interview doesn't work out.

Keep in mind that the agent gets nothing unless you take a job through him, and weigh his advice accordingly. The best way to find a good agency is through personal recommendations, and the worst way is to contact every agency in the city.

Above all, remember that in today's programmer job market, you are a valuable commodity. Know what you want and go after it.

Gershman is an assistant vice-president at Citibank in New York.

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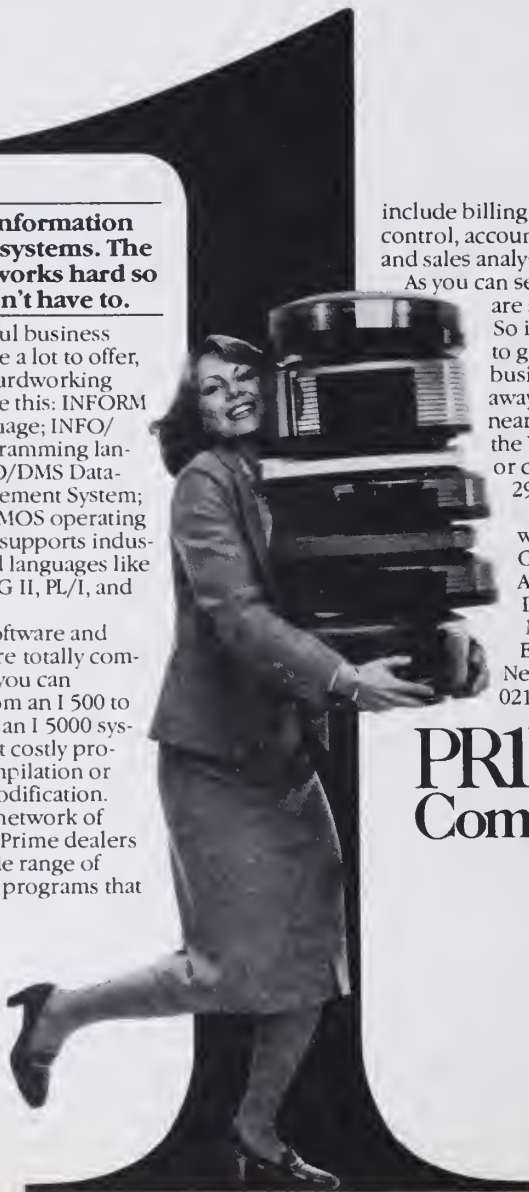
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Training Tips Suggested

(Continued from Page 31)

It turns out that the user/terminal interface that's now available on some minicomputers offers a much better match for the instructional needs of users than many DP instructors do. These systems organize the material in packets of about the right length (a screen-full); ask questions that require simple answers; provide immediate feedback on errors at command, program or data levels; and give reference information on-line.

And in cases of concept development where hands-on instruction won't work, I'd look to training films and/or videotapes — presented at the classroom level — before I'd choose an instructor at the blackboard.

• *The User as DP Instructor.* You may be aware of the recent trend of filling systems analysts slots with transferees from user departments and

supporting them with a comprehensive information systems training program. The theory is that this may be more effective than trying to make an analyst out of a Cobol programmer.

I can't help feeling that the same strategy applies to user training, namely, that an instructor who has come up the user route may have a better idea of topic content, sequence and timings for the training than the DPer has — or, at the very least, would try to minimize the intellectual trauma that often afflicts users during their first course of instruction in computer concepts.

Stone's paper has been published in the "Proceedings of the Seventeenth Annual Computer Personnel Research Conference, June 26-27, 1980, which is available from the ACM Order Department, P.O. Box 64145, Baltimore, Md. 21264.

Forth Making Strides

(Continued from Page 31)

and the freedom from errors it provides that SDL use is now being extended to branches across the Midwest. And, after watching the way changes can be developed, tested, modified and integrated in a few minutes right in the user department, I'm not surprised.

I can see no technical reason why the Banks of Iowa experience on the IBM system should differ at all from that of the Inma on the Level 6.

So, Forth is becoming "Cobolized." The SDL language, made up of file sections, data sections, work areas, menus and so forth looks more like a modern Cobol than the stack-oriented Forth with its colon definitions.

SDL is new now, but I don't expect to have to wait long before we hear more of it or of other Forth projects.

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IBM Users Gain FBA Support

• Package Runs DA Files

NEW YORK — A software package that is said to allow IBM users to run direct access (DA) files on fixed-block architecture (FBA) devices was introduced by H&M Systems Software, Inc., the U.S. subsidiary of Hubner Mergard in Frankfurt, Germany.

H&M contends its product, Vdam, picks up where IBM left off, a spokesman for the software firm said, stating IBM does not provide any means for its users to run DA files — such as Source Program Maintenance (SPM) — on FBA disks. To do so, therefore, often requires costly conversions of DA files to Vsam, he added.

With Vdam, H&M claimed, DA files can run on FBA devices without degradation of the device and without the need for program changes. Vdam supports IBM's 3310 and 3370 FBA disks.

Because it also supports count key data (CKD) disks, such as the 2314/19, 3330, 3340 and 3350, Vdam is also said to let users convert from one disk to another without having to change address logic.

For example, since IBM's recently announced disks, the 3375 and 3380, are CKD devices and will not be available until 1982, Vdam can aid those IBM users that move to FBA devices and later decide to convert back to the new CKD disks, the spokesman remarked.

Three Levels

Making up Vdam are three levels of software that insert into the core image library: the Test Version, which only supports systems with no FBA devices; the Production Version, which supports both FBA and CKD disks; and the File Version, which supports FBA disks but only predefined DTF (Define The File) names.

Vdam is reentrant, "fully com-

patible" with Bdam and is said to support all programming languages including compilers and report generators. Vdam is also SVA eligible, meaning it runs in the Shared Virtual Area, a prerequisite for running in VSE, the spokesman said.

U.S. shipments of Vdam are scheduled to begin at the end of the month. Although firm prices have not yet been established, the spokesman noted users will be able to obtain a perpetual Vdam license for between \$5,000 and \$7,000.

H&M Systems Software is at 40 Rector St., New York, N.Y. 10006.

ADR Offers 'Cobol/IMS'

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) has announced Cobol language extensions to support IBM's IMS data base/data communications (DB/DC) systems and plans to support the DB/DC Data Dictionary by year end.

Called Cobol/IMS, the product reduces the programming time and effort required to develop Cobol application programs for IMS/VS and IMS/OS, ADR claimed.

Cobol/IMS supports language extensions that consist of Cobol-like statements for requesting IMS services. These statements are coded as part of the Cobol application program and are automatically translated into equivalent Cobol parameters and CALL statements for IMS, the vendor claimed.

The product licenses for a one-time fee of \$14,900, and three- and five-year monthly lease plans are also available, ADR said from Rt. 206 and Orchard Road, Princeton, N.J. 08540.

• Disk Space Manager Updated

JERICHO, N.Y. — An integrated catalog file structure that supports both fixed-block architecture (FBA) and count key data (CKD) direct access storage devices was added in Release 4.0 of Computer Associates, Inc.'s CA-Dynam/D disk space management system.

Formerly available to installations running IBM's DOS, DOS/VS and DOS/VSE and Software Pursuits, Inc.'s DOS/MVT, CA-Dynam/D 4.0 was extended to also support the Computer Software Co.'s EDOS/VS operating system.

The catalog file structure can be shared by other Computer Associates file management components — such as CA-Dynam/T and CA-Dynam/FI — which, according to the vendor, simplifies

management control, speeds operations and improves security. A facility for converting to the new file format is provided in Release 4.0.

Also added in this latest CA-Dynam/D version were a faster access module for the catalog file structure, a faster catalog file DUMP/RESTORE program and FBA support by the VTOC display program.

The disk space manager's DYNUTIL disk file maintenance utility program was also improved by adding to it a DELETE file command, an ALTER file command and a DISPLAY command, the vendor said.

CA-Dynam/D 4.0 licenses for \$7,500 from Computer Associates at 125 Jericho Tnpk., Jericho, N.Y. 11753.

System 2000 Put on 1100; Gains IDD Enhancement

AUSTIN, Texas — Intel Corp. has released a version of its System 2000/80 data base management system (DBMS) for Univac 1100 CPUs and announced an enhancement to its Integrated Data Dictionary which runs with the DBMS.

Release 2.90 of the 2000/80 package for the 1100 includes several improvements that include programming language extensions for Cobol and Fortran, a simplified map procedure and Ascii and Fielddata Cobol and Fortran compiler support, the vendor said.

Other enhancements include an optimized internal sort for WHERE-clauses, disjoint records for the report writer facility, 16 LOCATE files and expanded string and function usage.

The Integrated Data Dictionary that attaches to the 2000/80 DBMS has been enhanced with control, documentation and com-

munications functions that give the data administration staff a way to develop and document a complete information processing environment, Intel said.

The data dictionary can be used interactively or in a batch mode. It can also be used for designing a data base or for analyzing and defining data structures. The package generates reports showing what impact a change to a part of the data environment would have on other parts of the system, the vendor noted.

System 2000/80 for the Univac 1100 costs between \$60,000 and \$100,000. The data dictionary is included in the 2000/80 package, but can be purchased separately. For IBM DOS environments, the data dictionary costs \$11,000, and for OS environments it costs \$20,000.

Intel is at 12675 Research Blvd., P.O. Box 9968, Austin, Texas 78766.



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DDs and the Mini User — Part 2

Most DDs for Minis Still in Rudimentary Form

By David Ferris
Special to CW

Data dictionaries (DD) have been accepted and commonly used in the mainframe area for several years. Some of the better known ones are UCC Ten from University Computing Co.; Datamanager from MSP, Inc.; Lexicon from Arthur Andersen & Co; and IDD from Cullinane Corp.

Now DDs are gradually becoming available on minicomputers, although most are still in a rudimentary form. Examples are:

- Datatrive, Digital Equipment Corp.'s interactive query/update/report processor for PDP-11s that uses a very specialized DD.

- Garden, a query system for DEC PDP-11 and VAX gear from International Data Base Systems that supports

This second part of a two-part article on data dictionaries looks at what is available for minicomputer users.

some DD functions.

- Oracle, Relational Software, Inc.'s relational data base management system with an integrated DD, which also runs on the PDP-11 and VAX.

- Pride-Logik, from M. Bryce and Associates, an extensive DD for PDP-

11s and Hewlett-Packard Co.'s HP-3000 processors that is normally used in conjunction with the vendor's automated system design methodology.

One Example

A good example of a full DD for minis is Dictionary/3000 sold by Imacs Systems Corp. of Los Angeles, which runs on HP-3000 minis. It is a stand-alone product in that it does not need to be part of another package; and to the author's knowledge it is the only such DD with a substantial mini user base.

Dictionary/3000 is highly integrated with Image, HP's data base manage-

ment system, and addresses three functional areas:

- Data processing relationships. Information on the data fields (or "items," in Imacs terminology), records and programs is maintained. This documents the use of data in programs and is used primarily for program development and maintenance purposes.

- Data base relationships. Information on data items, data base files and entire data bases is maintained. This is the "data base about the data base," and it documents what the data base contains.

- Natural real-world relationships. This is a particularly flexible and interesting aspect of Dictionary/3000. Real-world entities are related to other real-world entities and to data items. For example, departments can be related to their application documentation and, in turn, to related data items; functional areas (such as finance) can be related to data used on a subfunction basis (such as personnel data, payroll, benefits, skills).

DD Experience

Because DD is newly arrived to the mini world, many current Dictionary/3000 customers are organizations that have had prior DD experience in a mainframe environment and are turning to minis for the decentralized advantages they offer. According to David Dummer, president of Imacs Systems, "there is a real problem of communicating what our product does. Most people don't know what data dictionaries do, and, frankly, it takes a lot of time to explain how we can help unless they're already fairly knowledgeable."

Despite the lack of DD experience, Dictionary/3000 is growing in popularity among companies of all sizes and has a user base of more than 50 installations.

At the larger end, Exxon is currently negotiating for use of the product at many sites throughout North America. At the smaller end, GATX, a leasing firm with 150 employees, is using an HP-3000 for all in-house data processing. A staff of seven does all software development.

Joe Kraus, director of MIS at GATX, decided to look at the DD at the suggestion of an HP salesman. He uses it for two main reasons: "First, to get a handle on large volumes of Image data, much of which was in duplicate with many different data bases. Second, to use the data dictionary as a systems design and documentation tool. Industrywide, 67% of all programming is spent on maintenance, and Dictionary/3000 helps us cut down on this effort."

HP itself uses Dictionary/3000. Anne Davis, data base administrator at HP's Santa Clara Division, explained that HP uses the product "mainly because things were getting out of control."

"We have many different departmental users, from finance to engineering, many of whom do their own programming. We just didn't know what people were doing, and what data was available. The dictionary greatly eases many of these problems."

"Ferris is the senior partner of Ferris & Associates, a consulting firm based in San Francisco and London."

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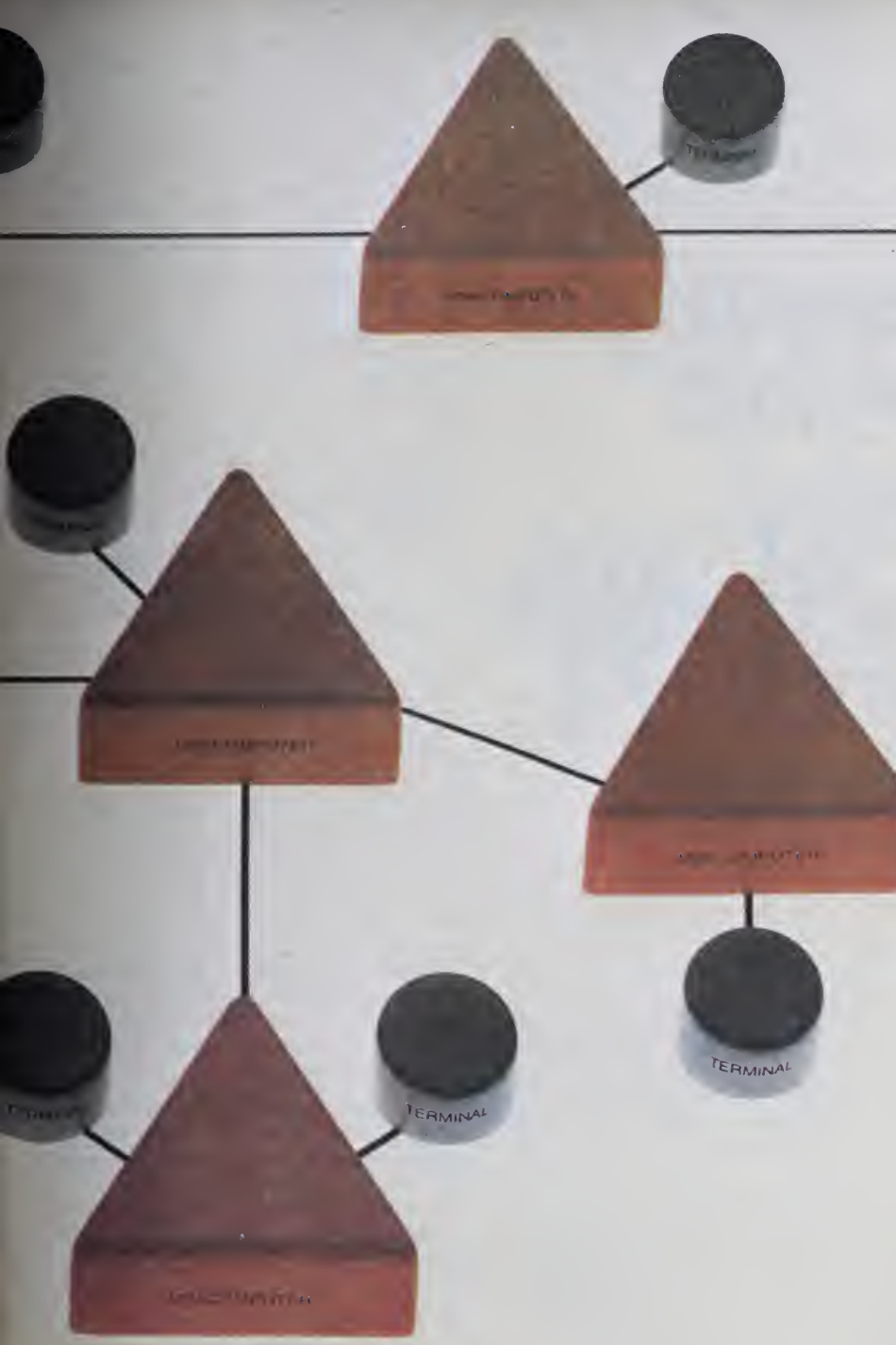
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Including Test Data Generator 'Panaudit' Gains 12 Enhancements

OAK BROOK, Ill. — Release 2.0 of Pansophic Systems, Inc.'s Panaudit package reportedly gives the DP and financial auditor additional techniques for verifying the validity of data in computer files.

Of 12 enhancements to the system, the three most important are a test data generator, source program validation and increased statistical sampling capabilities, according to a company spokeswoman.

The test data generator is used to generate files to test the reliability of programs before they are put into production, as well as to train new users of Panaudit.

The source program validation fea-

ture is said to compare two versions of a source program and indicate any differences. By using bit pattern analysis, the user can identify additions, deletions or changes between the two compared programs.

Additional statistical sampling routines include attribute, variable and stratified. Attribute sampling is used to estimate the probable frequency with which a given event will occur.

Variable sampling is used to estimate the value of a population composed of items with variable characteristics. When a population includes a number of extreme values in addition to the normal range, stratified sampling assists the auditor by reducing the sam-

ple size into individual "strata" containing similar values, the spokeswoman said.

Panaudit is available to users of IBM and compatible mainframes. The "universal" license fee for Release 2.0 (for both DPs and auditors) ranges from \$18,400 to \$29,900 and, for auditors only, ranges from \$13,900 to \$19,900, depending on options.

For users who already have the firm's Easytrieve Unlimited Sequential I/O (Usio) package, Release 2.0 fees range from \$6,500 to \$9,000. If a user has only Easytrieve, he can buy Panaudit for \$10,400 to \$13,900.

Pansophic is located at 709 Enterprise Drive, Oak Brook, Ill. 60521.

Compiler Backs OS Users

COLUMBIA, S.C. — An OS/RPG-II compiler that allows users in any OS environment to run DOS/RPG-II has been introduced by Policy Management Systems.

The compiler reportedly was developed to accept DOS/RPG-II source code with no modification and produces results similar to those obtained by running the DOS compiler.

The major benefits of the compiler are no efficiency loss, no change to source code and no additional runtime overhead as in the case of emulators or language converters, according to the firm.

The compiler comes with auto report and map programmer assistance features. The OS/RPG-II compiler can be licensed for \$18,750 initially plus a monthly fee of \$100 for a minimum term of five years. Policy Management Systems can be reached through P.O. Box. 1, Columbia, S.C. 29202.

Ultimately, all terminals require servicing.

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No other daisywheel terminal manufacturer offers a more complete service policy than Qume. It works basically like this:

All Qume Sprint 5® dealers are distinguished as either "service" or "standard" dealers. Service dealers provide end-user warranty service on all machines they sell, including spare parts and trained personnel.

Standard dealers offer a 90-day on-site service warranty with Sorbus, Inc., which has service centers in 32 major cities.

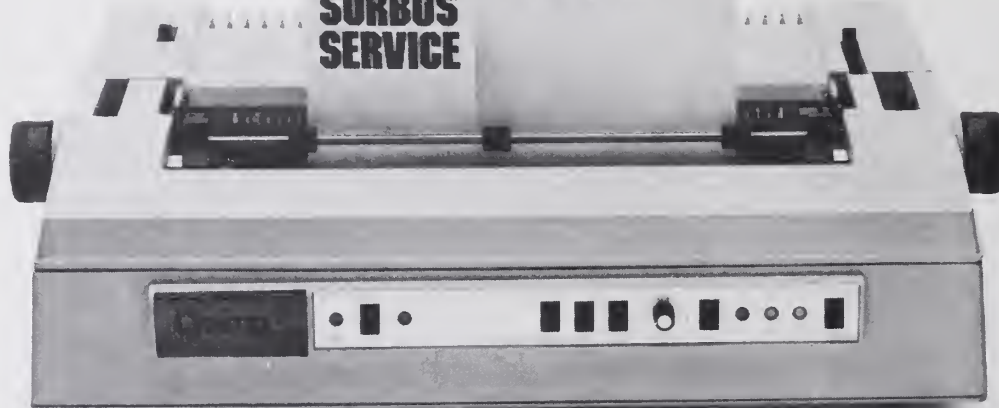
But if you don't work near one of these service centers, for warranty service you can send your terminal to the nearest Qume "depot," located in Texas, California or New Jersey.

Even the most reliable terminals in the business are ultimately going to need servicing. But with Qume, you'll never have to worry about service problems. For further information call or write Qume, 2350 Qume Drive, San Jose, California 95131. Tel: (408) 942-4000. TWX: 910-338-0232.

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SDA Adds 'Score' Version

NEW YORK — An interactive version of SDA Products, Inc.'s Score Cobol program generator for IBM OS users includes a prompter for on-line input with a CRT to generate Cobol code.

SDA also announced a guarantee on all Score products for new users: If Cobol programmers don't generate code at least 25% faster within 60 days of installation, the entire purchase price will be refunded.

Formerly available for Univac, Burroughs Corp. and Honeywell, Inc. as well as IBM mainframes, Score is said to be valuable as a time saver for program conversions, maintenance and one-time reporting.

The current version of Score licenses for \$25,000 to \$35,000, depending on the number of features the user wants, a spokesman said.

SDA is located at 260 Madison Ave., New York, N.Y. 10016.

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NOW Software Directed at Thrift Institutions

DAYTON, Ohio — A software package that reportedly allows savings and loan associations and other thrift institutions to provide negotiable orders of withdrawal (NOW) accounts to their customers has been announced by NCR Corp.

Previously offered primarily in the New England region, interest-bearing

NOW checking accounts can be offered by all financial institutions in the U.S. beginning in 1981, under recently enacted legislation.

The Demand Deposit Account/NOW software operates as part of the NCR Computerized Loan and Savings System (Class), which includes a range of applications handling all aspects of

on-line processing for thrift organizations, a spokesman said.

With the on-line system, NOW account data can be entered via teller terminal as the transaction occurs, and the data is processed immediately. On-line magnetic tape input is also provided, NCR said.

The application uses existing Class system savings account files and provides all processing and reports required in administering NOW accounts, according to the firm. The system offers several methods for handling overdrafts and line-of-credit advances and payments.

Other processing features include the ability to handle stop payments, to validate holds and to prepare a variety of reports, including notices of reject-

checks, new loan reports and stop payments listings.

Complete NOW account information for customers' monthly statements is also provided. These reports, notices and statements, available through NCR's Business Forms and Supplies Division, were designed to assure system compatibility and enhance the image of the financial institutions, the spokesman said.

The one-time license fee for the Demand Deposit Account/NOW enhancement is \$30,000. The alternative monthly license fee is \$1,200. NCR central software service is available at no additional fee. Field software service, provided to customers electing the monthly license fee, costs \$105/mo.

UCC Plans Seminar Series On Data Set Management

DALLAS — A series of seminars on data set management will be held in seven U.S. cities between July 22 and Nov. 6.

Sponsored by University Computing Co. (UCC), the free one-day meetings are intended for the DP manager concerned with improving the overall cost effectiveness of the direct-access storage device environment and gaining a better perspective of future trends in data set management.

The 1980 seminar schedule includes the following locations: Philadelphia, July 22; Los Angeles, July 29; Dallas, Sept. 4; New York, Oct. 9; Oakbrook, Ill., Oct. 16; San Francisco, Oct. 28;

'WP/3000' Does Report, WP Jobs

LAGUNA NIGUEL, Calif. — Bradford Business Systems, Inc. has introduced word processing (WP)/report writer software for Hewlett-Packard Co. 3000 minicomputers that provides users with commands to manipulate and format text and reports.

The WP/3000 package is said to be capable of tasks ranging from simple day-to-day correspondence to financial reporting of information stored in HP's Image/3000 data base. The basic WP component reduces the amount of input required to format a document over similar systems, a spokesman claimed.

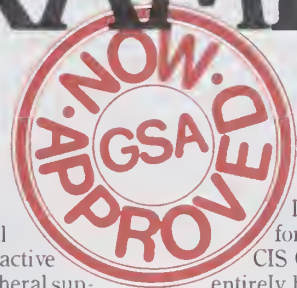
Separate default settings for margins, output devices, spacing, justification modes and other often-used functions may be predefined for each system user, allowing for customization. In addition, text can be formatted to the screen of an interactive terminal for review and then directed to a printer for final document preparation, the spokesman stated.

WP/3000 is aimed at applications such as dunning letters, billing, mailing labels and reminders, in addition to traditional WP chores. It sells for \$4,500 from Bradford at 24991 La Vida Drive, Laguna Niguel, Calif. 92677.

Atlanta, Nov. 6.

More information is available from UCC at UCC Tower, Exchange Park, Dallas, Texas 75235.

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Now, you can use a microcomputer for sophisticated business applications... because now there's CIS COBOL. Micro Focus developed this COBOL so your microcomputer can run the same programs as a minicomputer or a mainframe.

CIS COBOL is Micro Focus' Compact, Interactive, Standard COBOL which offers the advantages of COBOL... powerful data structure features, English-like language, existing programmer expertise... to provide you with a full commercial language. You won't be restricted by size either: a 64K byte microcomputer will compile up to 8000 lines of COBOL, more if the program's split into dynamically loaded modules.

Choose a Compact Compiler.

The Compact compiler runs on 32K byte microcomputer systems. Its powerful subset includes full support for random, indexed and sequential files.

Or choose the Standard Compiler.

The Standard CIS COBOL compiler requires a minimum 48K of user RAM. A super-set of the Compact compiler, implementing ANSI '74 COBOL to Federal Low-intermediate Level.

The same CIS COBOL extensions for conversational working, screen control, interactive debugging, and special peripheral support are in both compilers. And there are more reasons to consider CIS COBOL:

- It conforms fully to the ANSI '74 standard, so programs are portable upwards and downwards to minis or mainframes.
- Its interactive features enable mainframe programmers to get results fast... working on inexpensive microcomputers.

Forms

The FORMS utility lets you build a screen layout online at the CRT. Then it automatically generates COBOL record descriptions for inclusion in your program.

Forms-2

A superset of FORMS, it eliminates the need to write simple data entry and inquiry programs, because the programs can be automatically generated from screen definitions.

Environment

CIS COBOL products run on the 8080 or Z80 microprocessors under the CP/M* operating system, and on the LSI-11 or PDP-11 processors under RT-11. They are distributed in a variety of disk formats and come with a utility that enables you to use any make of CRT.

OEMs

Intel has adopted CIS COBOL and offers it (as iCIS-COBOL) for their Intellec and

Intellec II systems. Ideal for OEM's or private label, CIS COBOL was developed entirely by Micro Focus. Send inquiries for CIS COBOL object packs and application vendor terms to MICRO FOCUS or its licensed distributors. Distributor terms also available from MICRO FOCUS.

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Economic Forecast Service Available via Time-Sharing

GREENWICH, Conn. — The Service Bureau Co. (SBC) is now offering via its time-sharing services the Economic Forecasting Service providing economic analysis and prediction based on econometric techniques.

The forecasting service was designed by Evans Economics, Inc. (EEI), a Washington-based forecasting firm, to incorporate the supply side effects of tax cuts upon productivity and incentives.

The EEI macroeconomic model serves as the cornerstone of a multiple "Satellite Model" forecasting system, which includes financial, industrial production, producer prices, agriculture and international data.

Within several months, these models will be fully linked to the macro model, enabling simultaneous forecasts to be made, SBC said.

Users of EEI's services will also have access to existing SBC time-sharing applications, SBC said. The services are available through a local telephone call from most areas of North America, Western Europe and the Far East.

The EEI service uses an interactive modeling system featuring English language commands.

It is priced according to usage and specific site demands, SBC said from 500 W. Putnam Ave., Greenwich, Conn. 06830.

Program Development System Extends HP Fortran on 3000s

ORCUTT, Calif. — An application development system for Hewlett-Packard Co. 3000 processors that generates program specifications, design documentation and code in a continuous interactive and automated process is being offered by Mini Computer Application Software (MCAS).

The Program Development System Fortran (PDSFort) extends HP Fortran into a structured language that accepts English language input and output program documentation and code through use of an editor, program design module and a preprocessor, MCAS said.

The editor provides single command capability to create, merge and modify strings and files and operates with the

program design module to produce documentation. The preprocessor accepts structured programming constructs produced during the previous process plus standard Fortran code and automatically produces Fortran code and reference files, the vendor noted.

Main memory requirements are 20K bytes for PDSFort which costs \$3,000 for a perpetual lease for use of the object code, six months of updates and user manuals. The vendor can be reached through P.O. Box 2553, Orcutt, Calif. 93454.

Programs Offer Job Accounting, Chargeback

NEW YORK — Two job accounting and chargeback programs, AFast/VSE and Time, both of which include a report generator along with approximately 25 reports, are being offered by H&M Systems Software, Inc.

The two programs indicate what is happening at any given point in the daily operations, and the results can be graphically displayed. The programs include checkpointing which, unlike other DOS job accounting programs, does not require that a step END occur during the specified interval of the checkpoint, according to the vendor.

The AFast batch system and Time, the CICS system, reportedly run faster and provide reports easier to understand than the nearest competitor. AFast/VSE and Time are available for \$6,450 for both or \$4,500 separately.

MFast/VSE, a program which enables users to define and maintain maps and map sets on-line by using a map library, was also introduced.

The CICS software can structure the maps in Cobol, PL/I, assembler or BMS, the firm said. After using MFast, the input is stored in a map library, and the user may assign field names, attributes and field formats or use defaults. Existing maps can reportedly be redisplayed or modified at any time.

MFast can also check for overlapping or misplaced fields at the moment the map is created and a service task is included which can save and restore the library and print, on a batch printer, any map for documentation purposes, the firm said.

The software is available for rental or purchase at \$175/mo and \$4,000, respectively. All the software is available for a limited free trial period from the firm at 40 Rector St., New York, N.Y. 10006.

To work well for Manufacturing, MRP* must also work on the computer.

When searching for an MRP system, many manufacturing firms reason that: "Only functional capability is important, not how MRP works on the computer."

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At Cincom, we've put together a booklet of the "12 Common Misconceptions about MRP." This booklet will help you get a better grasp of MRP. Then you can come to grips with manufacturing control. We'll be happy to send "Misconceptions" to you. It's useful, and it's free. Write or call: Laura Larsen, Cincom Systems, Inc., 2300 Montana Avenue, Cincinnati, Ohio 45211, Telephone (513) 662-2300.



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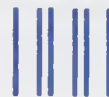
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Programs Let Burroughs Users 'Do-It-Yourself'

JACKSONVILLE, Fla. — Two packages that reportedly allow users of B6700 and larger Burroughs Corp. systems to develop customized on-line data entry and file management systems without programmers is available from Jacksonville Software Systems, Inc.

The Remote Data Entry (RDE) portion of the system handles batch input from users. It has fuel editing and batch balancing facilities and produces terminal operator reports and batch statistics, the vendor claimed.

The Remote File Maintenance (RFM) system provides enhanced capability for on-line inquiry and update and full editing capabilities, but is not organized by batches. It provides access on multiple keys and each key may contain multiple fields.

The RDE is available for \$5,500 and RFM, \$4,500. Together they cost \$8,500 from Jacksonville Software Systems, Inc., Burroughs Sq., 7555 Beach Blvd., Jacksonville, Fla. 32216.

'Focus' Runs Under CICS

NEW YORK — Information Builders, Inc. has expanded its information control package, Focus, to operate under IBM's CICS.

CICS users of Focus' report language, file management and decision support facilities will be able to converse with the system in an interactive mode. This means that "user-friendly" design features now available under TSO and CMS, such as on-line error correction and user prompting, are now available to the CICS user, Information Builders said.

In addition, CICS/MVS users will be able to dynamically allocate files using a new Focus command. The package is tuned so no degradation of CICS response time occurs for other users, the vendor claimed.

Focus CICS costs \$8,000 or \$240/mo, from Information Builders, 254 W. 31 St., New York, N.Y. 10001.

Cobol/3 Geared For DDP Use

MINNEAPOLIS — Northern Telecom Systems Corp. has announced Cobol/3, an enhanced subset of 1974 Ansi Level II Cobol, for use on its models 435 and 445 distributed data processing (DDP) systems.

Available at no charge to 435 and 445 users, Cobol/3 expands existing features, such as the Perform verb, and adds new features, including Indexed Sequential Access Method (Isam) file support, the use of the computational clause to specify packed decimal storage, new instructions and enhanced table processing.

The Isam file support reportedly allows for dynamic access and alternate key usage. Dynamic access capabilities allow a program to read an indexed file both sequentially and randomly.

Cobol/3 will be available in September from Northern Telecom at Data Park, Minneapolis, Minn. 55440.

Cash Flow Analyzed

PALO ALTO, Calif. — A service that provides investment officers with cash flow analyses to assess the profitability of issuing a mortgage-backed security is available through Remote Computing Corp.'s time-sharing network.

The Mortgage Security Analysis System analyzes the effect of changes in the mortgage interest during the life of the issue and the impact of the spread between mortgage yield and the cost of bonds on profitability.

Remote Computing Corp. is headquartered at 1076 E. Meadow Circle, Palo Alto, Calif. 94303.

'Factfinder' for System/34s Gives Query/Report Writing

OAK BROOK, Ill. — Professional Computer Resources, Inc. has released Factfinder, an on-line query/report writing package for IBM System/34 users.

Said to bring System/34 users one step closer to large mainframe capabilities, the package reportedly eliminates the waiting time for reports and inquiry programs. That wait sometimes takes several weeks on current System/34s, the vendor said.

The query/report package allows users to review information stored and prepare reports in less than five minutes, a spokesman claimed.

Other features include Factfinder Security, a protection software that al-

lows only authorized personnel to view confidential information, while nonconfidential information may be viewed by anyone; and Factfinder retrieval methods that allow personnel to retrieve information without extensive training, the vendor said.

All functions are menu-driven, and user keying is minimized throughout the system to numbers indicating the selected alternative. The package can print or display information from any system files in any query, the vendor claimed.

The package costs \$6,000 with a \$500 annual upgrade fee, the vendor said from 2021 Midwest Road, Oak Brook, Ill. 60521.

The Office of The President

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I look forward to seeing your reports on your visit to INFO 80.

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DEC's 'Datatrieve' Upgrade Enables Cross-File Views

MAYNARD, Mass. — Digital Equipment Corp. recently announced an enhanced version of its Datatrieve query, report and data management software.

Designed to work with DEC's RMS-11 records management files, the latest version of Datatrieve is available on RSTS/E, RSX-11M, RSX-11M Plus and IAS operating systems for PDP-11 computers and in compatibility mode for the VAX-11/780 mini.

Datatrieve reportedly enables users to locate, sort and update information in RSM-11 files and to generate re-

ports from those files. The recent version has been extended through variable-length record support, cross-file "views" and a revised and expanded documentation set, a spokesman said.

The cross-file views enable users to define logical records that are retrieved from multiple RMS-11 files, he explained.

The enhanced Datatrieve software, Version 2.0, will be available in September and will cost \$4,500, DEC said from 146 Main St., Maynard, Mass. 01754.

PDP-8 Gets Word Processing

STONEHAM, Mass. — Automation Development, Inc. has unveiled a word processing system with electronic communications and information retrieval capabilities to run on a Digital Equipment Corp. PDP-8 processor.

Visi-Net is available as software or in a hardware and software cluster package. The system is an upgrade of the firm's Compu-Text word processing software, but features an integrated file structure that is said to allow text and related data to be stored and processed together. Information can be accessed separately or as the related components of one document, and users have the capability to enter, modify,

retrieve and track information of varying lengths, a spokesman said.

The Visi-Net system incorporates a network communications architecture that allows two or more users to share a data base and work on the same document. The system can also be used for intracompany electronic mail, the spokesman noted.

DEC's PDP-8 is reportedly capable of driving most standard printers including IBM's 6670 and 6640. DEC's VT-100 or a VT-100-compatible terminal is the system's main workstation, but other terminals can be supported for document entry and printing. With the use of a telecommunications link, any peripheral can be remote.

Using the VT-100 as a main workstation provides the Visi-Net with an upgrade capability, the spokesman continued. With the addition of a DEC LSI-11 microprocessor, the VT-100 can support three terminals, a printer and a communications line at each site. Acting as intelligent clusters, the terminals in remote areas have access to a main data base and operate independently using a system diskette.

The unbundled software costs from \$15,000 to \$25,000, depending on the user's configuration, while prices for a packaged cluster with the PDP-8, a disk controller with two DEC RK05 disk drives and the ability to support five workstations start at \$19,000.

Automation Development is located at 38 Montvale Ave., Stoneham, Mass. 02180.

Automobile Package Runs on Pertec System

LAGUNA HILLS, Calif. — An inventory-intensive software package that features 11,070 part numbers on a single floppy disk is available for automobile parts stores and similar operations from Pacific Microsystems.

The package operates on the Pertec Computer Corp. PCC 2000 small business system, which supports up to five CRT terminals. In an auto parts store, two terminals and a printer could support four to six salespeople, the vendor said.

System features include automatic printing of sales invoices; stock order listings; quantity-sold reports to identify fast moving parts; and daily, monthly and yearly sales reports.

The package costs \$14,700 to purchase or \$425/mo on a lease plan, the vendor said from Suite A, 23121 La Cadena Drive, Laguna Hills, Calif. 92653.

'TSDump' Gives TSO File Display

MANHATTAN BEACH, Calif. — A file display system that reportedly offers immediate access to file information is available to IBM Time-Sharing Option (TSO) users from de Faro Software Systems Co.

The package, TSDump, was designed for a testing environment. It eliminates the time required and possible errors generated by Job Control Language handling and preparation of one-time programs to strip portions of a file for verification, the vendor said.

TSDump can help avoid problems caused by abends and bad data by giving fast access to the error-causing data and displaying it on a CRT terminal or printer without queues, the vendor added.

The package costs \$2,350 for a single site. A 50% discount is offered for multiple sites. The vendor can be reached through P.O. Box 3216, Manhattan Beach, Calif. 90266.

Tax File Subsystem Targets Most CPUs

DEVON, Pa. — Vertex Systems, Inc. has released a reporter subsystem consisting of a series of programs designed to load the subscriber's tax file, access sales and use tax rates and compute tax amounts.

The programs are written in Ansi Cobol and are usable on most mainframes and minicomputers. Two versions of the reporter are available: a GEO code that costs \$600 and a ZIP code that costs \$750.

More information is available from 222 Lancaster Ave., Devon, Pa. 19333.

Teletext Test to Gauge U.S. Consumer Interest

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — The first U.S. test of consumer response to teletext — an on-line information retrieval system that utilizes a commercial TV set at the remote end of the message path — is scheduled to begin here next January.

Funded mostly by the federal government, the test will be conducted by WETA-TV, a local public television station, and managed by the Alternate Media Center of New York University.

The first phase of the test, ending in 1982, is aimed basically at determining what teletext services generate the greatest viewer interest. The second phase, also planned to last two years, will explore various financing methods and try to establish criteria for pricing the services.

Widespread Interest

There is reportedly widespread interest in teletext and a companion system, videotex, within the U.S. computer industry and among users. New forms of electronic message delivery, particularly to the home, could be provided by either technology. Also, many business firms with dispersed offices are looking at teletext and videotex as a possible internal communications system.

The major difference between the two technologies is that videotex (also known as Viewdata or Prestel) is a two-way, interactive system which typically operates over dial-up telephone circuits.

Teletext messages are transmitted one-way, usually via TV channels, although a telephone circuit can be used to provide the return path and make the system interactive.

The upcoming WETA-TV test will start with 60 terminals, each consisting of a color television set equipped with a decoder that converts the incoming teletext signal into a TV display. The sec-

ond phase is planned to encompass 300 to 400 terminals, said John Carey, one of the project managers.

News, weather, sports results, library information, community announcements, consumer and home health advice are among the topics to be included in the teletext programs broadcast during the test. The material will be supplied by a number of government agencies plus some private organizations — notably two local newspapers, the *Washington Post* and *Washington Star*.

Terminals are to be installed in "public settings" — such as libraries, schools and social clubs for the handicapped — as well as private homes.

The broadcast information, which includes both text and

(Continued on Page 46)

Uses Intelligent Clusters

Software Backs DDP Applications

TORONTO — A self-contained data communications operating system for medium- to large-scale computers that is said to support an unlimited number of users in on-line, real-time distributed data processing (DDP) applications has been announced by Telecom Network Technology, Inc. (TNT).

The Netcom system controls the operation of a large number of computer systems and consists of intelligent multiterminal clusters connected in a multidrop fashion. The system utilizes a full-duplex bisynchronous protocol and runs in a hierarchy of Data General Corp. Micronova microcomputers and Eclipse minicomputers, a spokeswoman explained.

The system's Telesoftware reportedly provides a down-line loading capability and permits dynamic load balancing between processors and the ability to change the number of host and

DEC, Burroughs CPUs Gain Synchronous Link

CHAPEL HILL, N.C. — A software system that allows synchronous communications between Digital Equipment Corp. PDP-11 and Burroughs Corp. computers is available from Applied Information Systems, Inc.

The Burcom-11 software system supports the Burroughs point-to-point conversational protocol through either dial-up or leased telephone lines, a spokeswoman said. Burcom-11 also allows communications between PDP-11s.

The system's multiple buffers are said to ensure full utilization of transmission links. And error detection and record retransmission are handled automatically, the spokeswoman continued.

User-callable subroutines of Burcom-11 allow sending and re-

ceiving of messages, establishment and termination of transmission links and review of line status and error counts.

Applied Information's software runs under DEC's RSX-11M, RSX-11S, IAS and RSTS/E operating systems and is supported by DEC's DU11, DP11 and DUP11 synchronous interfaces as well as the vendor's DN11 auto-dial interface. But DEC's KG11 arithmetic unit is not required for operation of Burcom-11, the vendor said.

A single machine perpetual license for Burcom-11 costs \$4,400, includes a 90-day warranty and is available immediately, she stated. The vendor is located at Suite 207, 500 Eastowne Drive, Chapel Hill, N.C. 27514.

remote processors without affecting application programs.

Each of the system's intelligent clusters can support up to 14 user terminals and two printers, the spokeswoman continued. The remote clusters have no

magnetic peripherals, but feature printer spooling.

The system's host generally resides in the user's central location and consists of network control processors as well as application

(Continued on Page 46)

RCA Globcom Services Expanded to 18 U.S. Cities

NEW YORK — RCA Global Communications, Inc. (RCA Globcom) has announced its expansion of direct overseas telex, telegram and leased channel services to 18 U.S. cities and plans to add three more, pending Federal Communications Commission (FCC) approval.

The cities include Atlanta, Boston, Chicago, Dallas, Detroit, Houston, Los Angeles, Philadelphia, Cincinnati, Cleveland, Milwaukee, Minneapolis, Newark,

N.J., Pittsburgh, Pa., Stamford, Conn., St. Louis, Seattle and Hicksville, N.Y., which will serve Nassau and Suffolk counties.

Service to Baltimore, Denver and Memphis, Tenn., is under FCC consideration.

Customers in these areas will be able to obtain the services without intermediate handling by domestic common carriers, RCA Globcom said from 60 Broad St., New York, N.Y. 10004.

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U.S. Teletext Test to Gauge Consumer Interest

(Continued from Page 45) graphics, will be formatted into numbered "frames," each conforming to the dimensions of the TV screen, and stored in a Digital Equipment Corp. PDP-11/34 computer at the WETA-TV studio. This information will then be broadcast in a recursive sequence.

The viewer will access desired frames by inputting the related frame numbers into a small keypad attached to his decoder. He will begin the process by looking at an "index frame" that shows the major topics and the numbers of those frames containing detailed information related to each topic.

All teletext frames will be broadcast during the "blanking interval" that separates the individual frames of regular WETA-TV programs, so both services can be provided concurrently.

The test will involve a number of innovations, Carey said.

The formatting and coding of teletext information usually requires the information provider to acquire an intelligent editing terminal. In the Washington test, however, low-speed terminals, such as teletypewriters, will be used by most providers.

This scheme will allow the formatting and coding to be done on a centralized basis at the TV studio, which should reduce costs for the information provider and make it easier, later on, to find sponsors for the service.

As the teletext data base grows, it normally takes the viewer longer to access a desired frame, since the process is sequential rather than random. However, in the Washington test, not all the frames will be included in each broadcast loop. If there are four pages of sports results, for example, each page will be inserted in successive loops.

The data base planned for the test will have a maximum

of 400 frames, but only about 100 of them will be broadcast in each loop. This should make the maximum access time 12 seconds and the average time 6 seconds, Carey explained.

Service Financing

Probably the major question surrounding the future of teletext is how a commercial offering will be financed. WETA-TV already solicits an-

nual subscription fees from its viewers and could lease teletext decoders as part of this service for an additional charge, according to Carey.

The cost of the programming, he added, could be borne by the information providers, or it could be shared by the providers and the viewers. The teletext technology being used in the Washington test employs a Canadian system known as Telidon, which al-

lows the signal to be addressed to individual terminals, so a program could be sent only to those who paid for it.

Another key question impacting the future of commercial teletext is the cost of the terminal. The one to be used in the Washington test costs \$1,500 — \$700 for the TV set and \$800 for the decoder.

However, Carey expects the decoder price to drop to \$600 by the end of 1981.



Netcom Fits DDP Use

(Continued from Page 45) processors. The host is independent of the number of devices, and the number of computers can be expanded to meet user needs, she claimed.

Netcom's connection to large mainframes is provided by IBM 2780/3780, 3270 or Hesp links, the spokeswoman added.

Prices for the system start at \$50,000 plus \$1,000 per cluster controller. Additional information can be obtained from the firm through P.O. Box 5918, Station A, Toronto, Ont. M5W 1P2, Canada.

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Ramtek Adds 1,000-Line Color Monitor

SANTA CLARA, Calif. — Ramtek Corp. has unveiled a 1,000-line color monitor for graphics and imagery display systems and a refined version of the firm's GM 713/719 series of monitors.

The GM 865C color monitor is an expansion of the firm's GM 850 series and was designed to provide large-screen direct view presentations for small group audiences.

The unit incorporates a 25-in. CRT screen that utilizes a recently developed color shadow mask tube that reportedly does not hinder screen resolution. The 865C costs \$12,400.

Ramtek also announced its GM 714 monitor series, which complements the company's GM 713/719 products. The 714 uses a newly developed CRT that has an ultra-fine pitch shadow mask with an in-line gun structure. The unit does not employ any dynamic convergence controls, a spokesman said.

The 714 is geared for mapping, command and control; computer-aided design and manufacturing; process control; and image processing applications. Prices start at \$2,200 each. Ramtak is at 2211 Lawson Lane, Santa Clara, Calif. 95050.

Controller Replaces 3274, Offers Three Screen Formats

MINNEAPOLIS — Lee Data Corp. has unveiled a controller that is compatible with IBM's 3274 control unit (models 1A, 1B and 1D) and also supports the All-In-One Softprint Display.

The Model 320 Local Display System offers an All-In-One Display that incorporates three IBM 3278 models, the 2, 4 and 5. With the display, the operator can dynamically se-

lect either the 27-line by 132-column or 43-line by 80-column screen format as an alternate to the 24-line by 80-column screen format.

Adding the All-In-One capa-



The Model 320

bility to select the screen size that suits the current task avoids changing, relocating or upgrading existing equipment, the vendor claimed.

Softprint features of the Model 320 Local Display System allow viewing of print data without truncation or wrap-around, a spokesman said, adding this method provides significant cost savings over hardcopy printing.

The price for a Model 320 Local System controller is \$14,920, the vendor said from 5700 Green Circle Drive, Minnetonka, Minn. 55343.

Modem Assembly Fits Small Users

CHICAGO — A modem assembly for small time-shared computer and multiplexer sites is now available from Comdata Corp.

Up to eight rack-mounted printed circuit card modems operating a 300-, 1,200- and 2,400 bit/sec, including frequency division multiplex channels, may be included.

The unit costs \$295, the vendor said from 8115 N. Monticello, Skokie, Ill. 60076.



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Terminal Runs In Four Modes

BEDFORD, Mass. — A graphics terminal that is compatible with Tektronix, Inc. Plot-10 software and offers four operating modes has been introduced by Continental Resources, Inc.

The CPG-4010 graphics terminal operates in four modes to permit use for alphanumeric, graphics or both. Compatible with Tektronix Plot 10 software, the package allows use of sophisticated graphics and compatible status read-back that returns alpha cursor position and graphics status information upon receipt of an ESC ENQ command, the vendor claimed.

The unit incorporates a Z80 microprocessor and operates in the ADM-3A Alpha, 4010 Alpha, vector and point modes. The CPG-4010 also allows full screen usage, the vendor said.

The unit costs \$1,995 from Continental at 175 Middlesex Tnpk., Bedford, Mass. 01730.

Auerbach Offers Reference Service

PENNSAUKEN, N.J. — To meet the demand for information about data communications equipment technology and facilities, Auerbach Publishers, Inc. has created Datacom 80, consisting of four continuous information reference services.

The publications are *Auerbach Distributed Systems Reports*, *Auerbach Communications Network Reports*, *Auerbach Data Communications Reports* and *Auerbach Data Communications World*.

The reports will include overviews, objective competitive analyses, user reactions, configuration guides and equipment pricing data.

The *Auerbach Distributed Systems Reports* is an 11-volume service, designed for large companies that use distributed data processing. The service covers mainframes, minicomputers and communications and costs \$2,795 annually.

The six-volume *Auerbach Communications Network Reports*, aimed at medium-size firms or those using less complex communications networks, provides coverage on general-purpose minicomputers, data handling equipment and data communications equipment and facilities, as well as computer terminals, for an annual charge of \$990.

The three-volume *Auerbach Data Communications Reports* coverage is dedicated to communications facilities and equipment and computer terminals and costs \$675 annually.

The *Auerbach Data Communications World* provides information on popular, general-purpose minicomputers, communications facilities and equipment, as well as computer terminals. Smaller firms planning for data communications or those with limited activities may subscribe to the reference service for \$365 annually.

All of the reports in the reference service are updated monthly, the firm said from 6560 North Park Drive, Pennsauken, N.J. 08109.

For Interactive Business Use

Send/Receive Graphics Terminal Debuts

PARAMUS, N.J. — A 16-lb portable send/receive printing terminal said to be capable of producing low-cost, interactive business graphics has been introduced by Computer Transceiver Systems, Inc.

The Execuport 4000G wide-carriage terminal features 80- or 136-column printout on either paper or transparent film, according to a spokesman.

The 4000G can draw lines in any direction and print with a resolution of 1,920 points per square inch, or more than four times the resolution of ordinary 5 by 7 dot matrix printers, the spokesman claimed.

Connection to a remote computer is made via telephone lines through the unit's built-in acoustic coupler/modem.

A single control allows the Execuport 4000G to be switched from operation in the graphics mode to standard alphanumeric operation, the spokesman said.

Graphics output utilizes a modified Ascii print code with special graphic characters, while alphanumeric output utilizes the standard, 128-char. Ascii code.

The 4000G costs \$3,795, with quantity discounts available. Operating leases and financial leases are available starting at \$149/mo on a three-year lease.

Computer Transceiver is located at E. 66 Midland Ave., Paramus, N.J. 07652.



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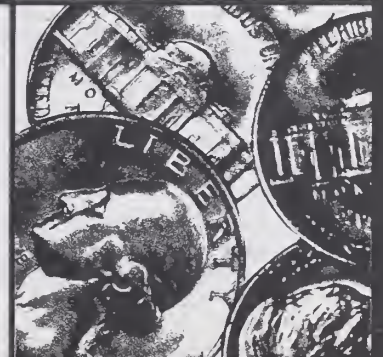
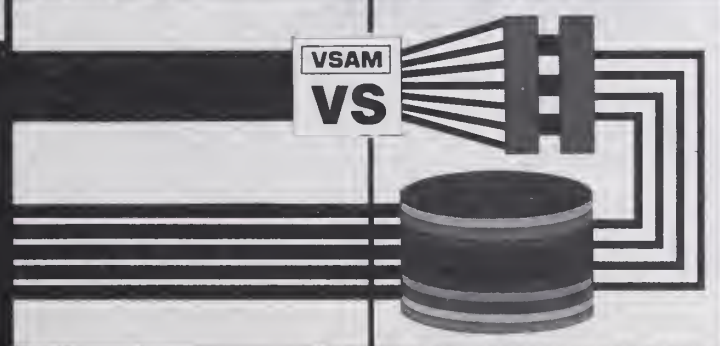
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MDS Trivex Controller Replaces IBM 3274

COSTA MESA, Calif. — MDS Trivex, Inc., a division of Mohawk Data Sciences Corp., has announced the Plus 80 control unit, Model 8074-1C, as an addition to its line of plug-compatible devices to IBM's 3274 controller.

The Plus 80 was designed to interface with both MDS Trivex and IBM CRT terminals and printers within the same cluster.

The 8074 communicates in

half-duplex mode over half-duplex or duplex communications facilities at switch-selectable speeds up to 9,600 bit/sec. IBM 360, 370, 30 series and 4300 mainframes can be used as host CPUs, the vendor said.

The basic controller will operate eight devices. The unit may be expanded to 32 devices through the addition of eight-device adapters, the vendor added.

A program diskette provides the ability to configure the cluster for initial requirements and later change those requirements based on future needs.

The diskette further provides the flexibility to configure the controller for BSC or SNA/SDLC operations alternately.

The initial release of the 8074-1C only provides BSC compatibility. SNA/SDLC

will be offered later in 1980, the vendor said.

Resident diagnostic programs are designed for immediate fault isolation, supplying information on all devices connected to the controller and controller-channel communications, providing faster recovery and reduced downtime, MDS Trivex said.

First deliveries are scheduled for early September. No definite price has been set yet, but

an MDS Trivex spokesman claimed the Plus 80 will cost approximately 10% less and lease for approximately 12% less than the IBM 3274.

MSD Trivex is at 3180 Red Hill Ave., Costa Mesa, Calif. 92626.

Multiplexer Takes Eight Channels Over One Link

SILVER SPRING, Md. — Rixon, Inc. has introduced an intelligent multiplexer that incorporates a statistical multiplexing technique and can handle up to eight asynchronous channels over a single composite link.

The microprocessor-controlled DCX815 provides an unrestricted intermix of input speeds from 50- to 9,600 bit/sec asynchronous and any 5-, 6-, 7- or 8-bit Baudot, Ascii or IBM code.

Speeds and codes are switch-selectable on a per-channel basis, a spokesman noted. The user can also select an automatic baud rate (ABR) that allows any low-speed channel to adapt automatically to the speed of the incoming data.

To increase throughput, the multiplexer assigns time slots to active channels only and averages the input data, which may be two to four times greater than the output. In addition, an error-checking routing in the device protects the communications link between multiplexers from transmission errors.

The DCX815's random-access memory buffer bridges several seconds of noise or break conditions on the composite link without loss of data, Rixon claimed.

All of the unit's controls and indicators for network configuring and testing are accessed by lowering the multiplexer's front panel.

The DCX815 is available as a four- or an eight-channel unit. The four-channel can be upgraded to an eight by adding an expander card.

The four-channel device costs \$1,700, the eight-channel unit costs \$2,200 and the expander card sells for \$600, the spokesman stated from the company at 2120 Industrial Parkway, Silver Spring, Md. 20904.

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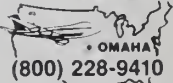


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In Alltech Survey

DEC Outranks IBM for Maintenance

By Rita Shoor
CW Staff

PENNSAUKEN, N.J. — IBM ranks second to Digital Equipment Corp. in keeping its customers satisfied in terms of overall hardware maintenance services, according to a survey by Alltech Publishing Co. here. "Maintenance in Computer Installations" based its conclusions on the percentage of users rating their service "satisfactory" or "unsatisfactory."

The survey sample was derived from what Emily Rieker, Alltech vice-president, described as "large DP installations with gross annual sales ranging from approximately \$1.2 million to \$13 billion," and said all conclusions were based on responses received from 176 organizations prior to October 1979.

The responding sample, however, included about 93 IBM installations, and 92 of them were willing to respond to the question on satisfactory maintenance.

Only 11 respondents were classified as DEC installations, according to the survey, and all the DEC respondents rated their overall service as satisfactory.

Of the respondents described as having only IBM CPUs in their installations, 86 (93.5%) rated the maintenance service satisfactory, while 6.5% (six respondents) said the IBM service was unsatisfactory.

When the same question was put to 35 respondents classified by Alltech as "other major manufacturer installations," 34 were willing to rate their service. Of those 34, 31 (91.2%) said service was satisfactory.

Of the three that rated their service as unsatisfactory, two were Burroughs Corp. installations and the other respondent utilized equipment from Univac.

Honeywell, Inc., Control Data Corp., NCR Corp., ITEL Corp. and Amdahl Corp. were the other vendors represented in this group.

Mixed Installations

Again, the feeling of satisfaction was prevalent among respondents working in environments classified as "mixed manufacturer installations" — those having CPUs from more than one vendor — Alltech's survey found.

Of the 36 companies in this group, two rated the individual CPU manufacturers separately and one did not respond. The result was that 33 (89.2%) gave an overall rating of satisfactory to their service organization, and four described service as unsatisfactory.

A total of 84 CPUs were represented in the mixed manufacturer installations, and IBM, DEC, Hewlett-Packard Co., Univac, CDC, Honeywell, Burroughs, NCR and Four-Phase Systems, Inc. were among the vendors that were mentioned by at least two users in

this group. Amdahl, Data General Corp., General Automation, Inc., ITEL, Microdata Corp., Mohawk Data Sciences Corp. and Raytheon Corp. had a single CPU in one of the 36 installations, Alltech stated.

All the unsatisfactory ratings were in mixed installations that are IBM-based, according to the company. Two of these had rated their IBM equipment as satisfactory, however, with DEC and HP being characterized as unsatisfactory. One of the other two unsatisfied respondents indicated a mix of IBM, DEC and NCR equipment and the remaining one had hardware from IBM, DEC and Microdata, an Alltech representative said.

Maintenance Sources

Responses to Alltech's question regarding the sources of computer maintenance underlined the tendency for installations having CPUs from multiple vendors to be more dependent on sources other than the manufacturer. The 43 answers from these 36 compa-

nies showed that slightly less than three-fourths (74.4%) of the respondents looked to the manufacturer for hardware service.

Eight users (18.6%) obtained their service from third-party firms identified as CDC, Comma, Raytheon Service Co., Sirvess, Inc., Sorbus, Inc. and Syntronics, according to Alltech. Three of this group maintained their own equipment.

When compared to the total 182 responses to this question, the percentage of firms using third-party organizations for maintenance drops to 7.1% (13 of the respondents). One conclusion suggested by this data is that CPU maintenance from third parties is not a particularly significant option for most computer installations, Alltech said.

More information about the two-volume survey, which also includes user maintenance profiles of companies with equipment from various vendors, is available from Alltech Publishing Co., 212 Cooper Center, N. Park Drive and Browning Road, Pennsauken, N.J. 08109.

Bits & Pieces

Storage Technology to Begin Shipping STC 8360 Disk Drive

LOUISVILLE, Colo. — Storage Technology Corp. will begin volume shipments of its newest disk drive, the STC 8360, in the third quarter.

STC's 8880 disk control unit will be shipped in the fourth quarter.

A Media Interchange Switch will be shipped in October, and a multiple format mapping package will be available in September, the vendor said from 2270 S. 88 St., Louisville, Colo. 80027.

CDC's Desktop Matrix Printer Gives Hard Copy for Plato

MINNEAPOLIS — A desktop matrix printer that provides hard copies of text and screen images from Control Data Corp.'s Plato computer-based education system is now available from CDC.

Enclosed in a soundproof cabinet, the dot matrix impact printer produces one to five copies of an image at a maximum rate of 115 line/min using internal Ascii characters or at a reduced rate depending upon the graphics or display involved, the vendor claimed.

When printing normal alphanumeric information, the printer generates up to 132 char./line.

The printer costs \$3,950 or may be leased for \$200/mo. the vendor said from Box 0, Minneapolis, Minn. 55440.

Honeywell Level 6 Terminal Runs 'Data Entry Facility II'

WALTHAM, Mass. — Honeywell, Inc. has unveiled a terminal for use with its Level 6 Data Entry Facility II software.

The VIP7207's major feature is its offering of two numeric key groups — one embedded in the touch-typing area in the data entry arrangement and one in a calculator-like arrangement in the right side of the keyboard.

The company also announced a field-kit version that permits modification of VIP7200 and VIP7205 units for use as a VIP7207.

The terminal costs \$1,980 and the field-kit version is \$350, the vendor said from 200 Smith St., Waltham, Mass. 02154.

Paper-Tape Transmitter Reads Five- to Eight-Level Tape

SAN GABRIEL, Calif. — Addmaster Corp. has introduced a stand-alone paper-tape reader and transmitter that can read five- to eight-level tape and transmit 7 to 11 frame/char. at 50- to 9,600 bit/sec.

Other features include starting and stopping on character at all speeds; a choice of manual control or X-on or X-off; 90 to 260 volt; 50- to 60Hz power; and even or odd parity, the vendor said.

The unit is desktop or rack-mountable and costs \$656 to \$779 from the vendor at 416 Junipero Serra Drive, San Gabriel, Calif. 91776.



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Cartridge System Backs Up 8-In. Winchester Drives

MONROVIA, Calif. — A fully integrated cartridge tape system to back up 8-in. Winchester drives has both transport and formatter in one package, according to its vendor, Kennedy Co.

The Model 6450 measures 8.5 in. wide by 4.5 in. high by 16.5 in. deep with the embedded formatter allowing disk and transport to be placed side by side in a 19-in. rack. The unit dissipates less than 40W, the firm said.

Using 6,400 bit/in. recording density and serpentine serial recording, the 6450 has an unformatted capacity of 17.3M bytes with a 450-ft DC-300 cartridge and 11.5M bytes

with a 300-ft cartridge. Transfer rate is 192K bit/sec, read/write speed is 30 in./sec and fast-motion speed is 90 in./sec.

The transport employs a switching-bridge servo amplifier that is 65% more efficient than conventional linear-servo designs, according to the firm.

The microprocessor-based formatter offers prewrite compensation to minimize pulse crowding and phase distortion for higher write-data integrity. The Model 6450 cartridge transport and formatter costs \$1,700 from Kennedy at 1600 S. Shamrock Ave., Monrovia, Calif. 91016.

DEI Cartridge Tape Drives Run at 30- or 90 In./Sec

SAN DIEGO, Calif. — Data Electronics, Inc. (DEI) has enhanced its S-3 line of streaming digital cartridge tape drives to offer a choice of speeds and transfer rates.

Designed for use with small Winchester-type disk drives, the S-3 line now runs at 30- or 90 in./sec. This is said to increase the drive's transfer rate to a choice of 1.67M byte/min or 5M byte/min.

The S-3 drives are microprocessor-controlled with either serial or parallel interface. Group code recording is at 7,500 bit/in. and is used with a variety of internal error detection checks.

Both DEI's streaming drive and a stripped-down streaker version offer

digital servo electronics, a digital magnetic tachometer, LED sensors, a tape cleaner and full bar ac erase, the vendor said.

The 10M-byte drive costs \$746 and the 20M-byte version is \$788 from DEI at 10150 Sorrento Valley Road, San Diego, Calif. 92121.

System Handles Data Collection In Factories

NORTHBROOK, Ill. — Infolink Corp. has unveiled a factory data collection system to collect production, material and labor data from wherever it is generated.

Called the Infolink 5000, the system includes the 5100 controller which operates with customized application software to control and direct a network of data entry terminals, printers and other peripherals.

The system can be configured from a series of 16-bit processors with memory capacity of 32K to 256K bytes, and accommodates up to 128 terminals on multidropped lines up to a distance of 10,000 feet at 9,600 bit/sec, the vendor claimed.

A typical system with 20 terminals is priced between \$75,000 and \$100,000, depending on configurations and systems specifications, the vendor said from 1925 Holste Road, Northbrook, Ill. 60062.

Device Collects Data in Field

HINGHAM, Mass. — A self-contained, battery-operated data collection and processing system for hydrography, material handling and other field applications has been introduced by Digital Design & Development (DD&D).

The PSS-1 portable computer system is said to allow data collection, processing and recording in the fields.

Featuring operator-controlled interrupts and status inputs, the system can control external devices such as distance-measuring and depth-sounding equipment, process control and environmental sensors, position plotters and serial terminals.

Operating on 12/24 Vdc or optional ac power supply, the 60-lb PSS-1 is housed in a water-resistant fiberglass case with splash cover. The unit is priced from \$21,000, depending on specifications. DD&D is located at 25 Industrial Park Road, Hingham, Mass. 02043.

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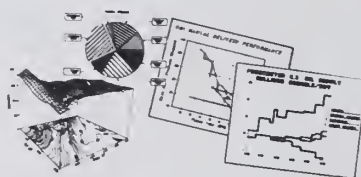
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Includes Two Programmable Models
Canon Brings Out Desktop System Line

LAKE SUCCESS, N.Y. — Canon, Inc. has introduced a series of programmable and nonprogrammable desktop computers that feature built-in printers and have communications capabilities.

Each model in the TX series — the TX-10, TX-15 and TX-25 — features an 8-bit micro-processor and 15K bytes of user memory that can be expanded to 31K bytes. The computers weigh about 15 lb each and are roughly the size of a portable typewriter.

The TX machines use an extended Basic and Assembler languages and include a 20-column display and a 26-column impact printer that is capable of producing two copies in addition to an original. The TX-25 also has a built-in micro floppy disk drive for program or data storage, a spokesman said.

When a modem is attached, the units reportedly have full asynchronous communications capabilities and can interact with



The TX-15

large mainframes. In addition to one modem port, members of the TX series have an RS-232C interface port for peripherals, the spokesman noted.

Both the TX-15 and TX-25 have full typewriter keyboards, while the TX-10 has a

10-key pad with 26 labeled keys.

User programs are stored in the unit's CMOS or programmable read-only memory. Canon is optionally offering a full banking package containing 24 programs to handle jobs such as installment loans, commercial loans and amortization schedules. A package for automotive dealers, containing routines on finance and insurance, and other packages for statistical markets, government and education will be available in the near future, the spokesman claimed.

The computers will initially be marketed through the company's dealer network. The TX-10 and TX-15 will be available in September and sell for \$1,295. The more advanced TX-25 and its price tag, however, will not be released until December.

Canon's Systems Division is located at 10 Nevada Drive, Lake Success, N.Y. 11042.

Multilanguage System Based on HP 1000

PALO ALTO, Calif. — Hewlett-Packard Co. has unveiled a multilanguage computer system aimed at program development that consists of the HP 1000 Model 45 minicomputer and a variety of program optimization packages.

The Performance/45 System also has a number of high-performance compilers, microprogram development and screen-editing software, a spokesman said.

The HP 1000 Model 45 processor incorporates an F series computer and 512K bytes of main memory, expandable to 1.8M bytes. The hardware also features 19.6M bytes of disk storage, expandable to 960M bytes, and a graphics terminal.

Designed to act as a programming tool, the Performance/45 System includes a number of software languages and routines. The first, Pascal/1000, is a superset of industry-standard Pascal and is basically a block-structured language known for its data and control structures. The superset reportedly helps speed up program design, debugging, documentation, modification and maintenance.

The second, Fortran 4X, is a superset of Ansi Fortran 66 and has compilation speeds as high as 3,000 line/min CPU and 2,000 line/min in real-time, the spokesman claimed. Fortran 4X is said to be upward-compati-

ble with HP Fortran IV and features direct-access I/O, double-word integer data type and IF-THEN-ELSE construction.

Editing Package

Edit/1000 is an editing package that interacts with users in line or screen modes. In the line mode, it provides for basic text maintenance, character string search and replace capabilities.

Finally, Accel/1000 is a software package that profiles program activity, showing the user precisely where execution bottlenecks exist, HP said.

All combinations include a minimum of

250K bytes of HP 1000 memory plus one of the following products: the Pascal/1000 compiler; the Image/1000 data base management system; the Datacap/1000 factory data collection software; the RTE-IVB multi-user, real-time operating system; the HP-IB fiber optics link; or L series computer featuring a distributed intelligence architecture.

The technically oriented Performance/45 Model 1000 is priced at \$57,500 on orders placed through Sept. 30, but will cost \$64,000 after that date.

Delivery is estimated at eight to 12 weeks from the firm at 1501 Page Mill Road, Palo Alto, Calif. 94304.

DG Adds Mid-Range CPUs

WESTBORO, Mass. — Data General Corp. has expanded its commercial systems (CS) line by announcing two mid-range CPUs.

The CS/10 is aimed at businesses with annual sales between \$100,000 and \$10 million. It comes in two models, the C1 with 64K bytes of main memory and the C3 with 256K bytes.

Also announced was the CS/70, aimed at firms with sales of more than \$20 million. The Model C/5 in that line offers 256K

bytes of main memory and will accommodate up to nine terminals. The CS/70 Model C/6 offers 512K bytes of main memory and can accommodate 17 terminals, the vendor said.

The additions to the CS line were designed to handle order entry, accounts receivable and payable, payroll and general-ledger functions. The systems are programmed in interactive Cobol. The CS/10 costs about \$11,000 and the CS/70 about \$40,000, the vendor said from Rt. 9, Westboro, Mass.

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Up to 128M Bytes Shared Multiuser Micro System Debuts

SANTA CLARA, Calif. — OSM Computer Corp. has introduced a multiuser, multi-tasking microcomputer system that is said to offer each user an MPU, memory, I/O and up to 128M bytes of shared disk memory.

The OSM Model 6300 consists of a Z80 MPU, a service processor, 64K bytes of main memory, a console I/O and an

optional local printer. Each system uses the CP/M release 2.2 disk operating system.

Communication between the user and the service MPU is handled via 16-bit interprocessor communications and not through the S-100 bus, the vendor noted.

The unit comes with two 8-in. double-density floppy disk drives. A double-sided

disk is optional, as are hard disks in 32M-, 64M-, 96M-, and 128M-byte increments.

The complete system is available with an IBM 3101 CRT terminal and Texas Instruments, Inc. 820 receive-only or optional letter-quality printer for \$5,195.

OSM is at 2364 Walsh Ave., Santa Clara, Calif. 95051.

IBM 2770 Emulation Among Lexitron Additions

CHATSWORTH, Calif. — Lexitron Corp. recently announced a number of enhancements for its VT text processing systems, including an IBM-compatible communications protocol, a Basic programming capability and a print multiplexer that allows users to develop clustered word processing (WP) groups.

The communications option, IBM 2770 protocol emulation software, allows VT system users to communicate with IBM-compatible WP systems and their associated high-speed inkjet and laser printers. The software is contained on a minidiskette.

Like all software designed for Lexitron's VT systems, the 2770 program operates on a menu-selection procedure and contains interactive instructions that lead the operator through various transmission criteria. On-line verification indicates whether all appropriate selections have been made, and an identification number can be included for security purposes, a spokesman said.

The emulation package has speed selections of 2,400 or 4,800 bit/sec, or a rate can be established by the modem user. The selectable code sets are Ascii, Ebcdic or Ebcidic transparent. The program includes the automatic transmission of job control language information and a compress transmission option that is said to remove consecutive space characters from data during transmission and reinsert them when receiving.

The communications software can be used on the firm's 1201 VT, 1202 VT and 1303 VT systems and is priced at \$300. If, however, a VT system has not previously been equipped to handle communications, the necessary hardware costs an additional \$1,200. A variety of lease plans is also available, the spokesman noted.

Basic Capability

The second enhancement, introduced at last month's Syntopian VIII convention, is a Basic programming capability for the company's 1202

and 1303 VT systems. Using the Basic language, users can turn their WP systems into multifunction information stations, the spokesman observed.

Lexitron enhancements to the Basic package include communications support for an asynchronous channel, allowing VT workstations to transmit programs and data; screen editing; initialization from a command file, allowing operators to run programs without manually executing system initialization; and a clear screen command.

The basic interpreter program will be available this October and costs \$3,500.

Finally, at the same word processing show, Lexitron showed a print multiplexer that allows users to connect up to six VT workstations in any combination and up to three Lexitron-compatible printers.

When connected to the VT 1630 multiplexer, any workstation can reportedly select any printer, allowing users to send documents for continuous forms to one printer and other jobs to other print stations.

When printers are selected, an extended menu is displayed which gives the operator a choice of printers and additional printer status information, the spokesman continued. Most print commands are identical to those currently used by VT operators, limiting the amount of training needed to operate the system additions.

The multiplexer makes it possible to dedicate a specific printer to a specific editor, which has the effect of taking the printer and editor "out of the system" without plugging or unplugging cables, the spokesman said. A variety of cable lengths, ranging from 15 ft to 100 ft, is available to facilitate installation of custom work groups.

First customer shipments of the 1630 are scheduled for September. The unit costs \$2,095 from Lexitron at 9600 DeSoto Ave., Chatsworth, Calif. 91311.

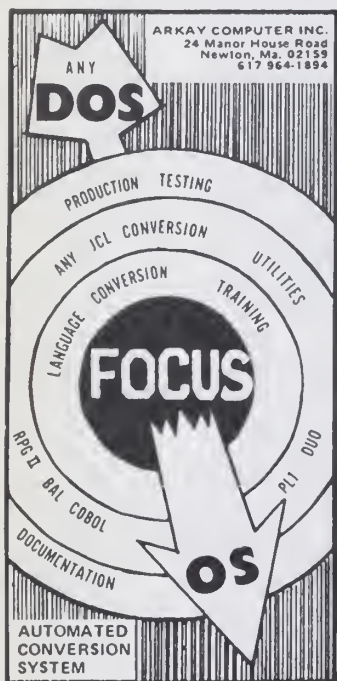
Controller for Novas Handles CDC Drives

ELMSFORD, N.Y. — Mini-Computer Systems, Inc. (MCS) recently announced a disk drive controller for Data General Corp. Nova minicomputers that can handle up to four Control Data Corp. storage module, cartridge module or mini module drives.

The MCS Model 3000 is a one-board device that is said to give users the capability of building disk systems with up to 1.2G bytes of mass storage. The controller features transfers of up to 32K words with a single command, while crossing cylinder and head boundaries automatically using a 1K-word data buffer.

Addressing can be either by disk address or by block number, while error-correction facilities are provided by the unit's on-board microprocessor.

The controller costs \$3,600 with deliveries scheduled for this month from the firm's Peripheral Products Division, 399 Fairview Park Drive, Elmsford, N.Y. 10523.



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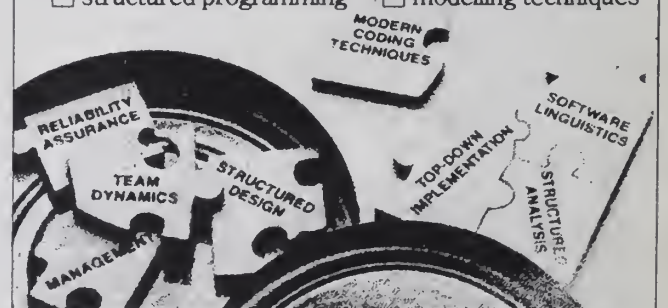
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Mini Bits

Controllers, Printers PDP-11-Compatible

MENLO PARK, Calif. — BDS Computer Corp. has introduced a line of plug-compatible controllers and line printers for Digital Equipment Corp. PDP-11/04 through VAX-11/780 minicomputers and it claimed they are less expensive than their DEC counterparts.

The systems provide 300 to 1,200 line/min at prices of \$6,250 to \$29,850 including controller and cables. The equivalent DEC LP-11 series printers are priced at \$8,600 to \$63,000, BDS claimed.

The LPC-11 controllers are fully compatible with the DEC Unibus and occupy one "quad" slot in the system backplane.

The printers are band or drum units with 132- or 136-column-line lengths.

BDS Computer Corp. is located at 1120 Crane St., Menlo Park, Calif. 94025.

Remote Diagnostics Added to PE CPUs

NEPTUNE, N.J. — Perkin-Elmer Corp.'s (PE) Customer Service Division is offering a remote diagnostics feature for

its 3220 and 3240 CPUs.

The diagnostic unit consists of a controller and a three-position, key-activated modem. The unit attaches to a standard telephone; hardware problems can be communicated to Perkin-Elmer technicians at Los Angeles, Chicago and Neptune service centers.

The diagnostics feature costs \$225 from the vendor at 51-71 Davis Ave., Neptune, N.J. 07753.

HP Personal CPUs Get On-Site Service

PALO ALTO, Calif. — Hewlett-Packard Co. HP-85 personal computer users can now avail themselves of "on-site" service.

Users within 100 miles of an HP service office will receive next-day response under the terms of an agreement that costs \$25/mo. Users beyond the 100-mile limit will be subject to longer response time and a higher charge for the service.

For an additional fee, HP-85 peripherals such as printers, plotters and floppy disk drives can be covered by the on-site agreement, the vendor said from 1501 Page Hill Road, Palo Alto, Calif. 94304.

Tape Control Unit Backs PDP-11, VAX

HOUSTON — Information Products Systems, Inc. has released its Model 7800 magnetic tape control unit to support Digital Equipment Corp. PDP-11 and VAX-11/780 CPUs.

The unit supports group code reporting, phase-coded and non-return-to-zero inverted tape densities. The unit is compatible with PDP-11 and VAX 11/780 Unibus adapters and allows attachment of higher performance magnetic tape systems, the vendor said.

The control unit supports triple-density tape systems and three-mode byte swapping required to generate DEC-compatible tapes.

The unit costs \$10,500 from the vendor at 6567 Rookin, Houston, Texas, 77074.

Xycom Introduces Z80-Based System

ANN ARBOR, Mich. — A tabletop "microhost/development" package designed for industrial environments is available from Xycom, Inc. The 3805A is a stand-alone, floppy-disk-based microcomputer system for software development and distributed network applications, the vendor said.

The Z80-based system includes 96K bytes of random-access memory, parallel and serial I/O, a 93-key intelligent keyboard and an integrated integral 12-in. CRT. The unit uses an IBM 3740 format-compatible floppy disk drive with 250K bytes of mass storage and a tabletop line printer, the vendor said.

The 3805A costs about \$10,000. The vendor may be reached through P.O. Box 984, Ann Arbor, Mich. 48106.

Piiceon RAM Board Addresses 16M Bytes

SAN JOSE, Calif. — Piiceon, Inc. has unveiled a high-speed error correcting dynamic random-access memory (RAM) board that runs in any IEEE-standard 5-100 bus. Designated Superem 3, the memory can address up to 16M bytes and be configured for either 8- or 16-bit processors.

The product features error-checking and correcting circuitry that can detect and correct all single-bit errors automatically before they reach the CPU, the vendor claimed.

Single- and double-bit error reporting is controlled by software. An error status register is available for interpreting syndrome bits into a failing memory location. Memory refresh is totally transparent to the processor.

The price for the product is \$1,700, the vendor said from 2350 Bering Drive, San Jose, Calif. 95112.

Stratmar Business Turnkey Targets Medium-Size Firms

NEW YORK — Stratmar Business Solutions Corp. has announced a business turnkey system for medium-size firms.

Supervisor II is built around a Data General Corp. Nova/4 and offers order entry, inventory control and job cost applications in addition to standard accounts payable, accounts receivable and general ledger functions, Stratmar said.

Users of Supervisor II can expand their computing

power without having to make programming changes normally required when upgrading from a single-terminal to a multiterminal environment, the vendor claimed, adding that all the user has to do to expand his system is to add CRT terminals.

The system costs about \$710/mo on a rent and lease basis or \$54,280 to purchase, Stratmar said from 501 Madison Ave., New York, N.Y. 10022.

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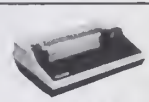


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Users to Pay More

IBM Price Hike Ripples May Start Wave

By Tom Henkel
CW Staff

Although a current International Data Corp. (IDC) report suggested the recession has not dampened users' willingness to buy [CW July 14], users will definitely be paying more for most systems.

IBM, viewed by many as the industry trend setter, just boosted its prices for the second time in

six months. The increase — which raises rent, lease and maintenance charges on most major hardware by 5% to 10% and boosts some software, hourly maintenance and customer education 7% to 10% — may set off a wave of similar increases throughout the industry.

Some vendors had already buckled to inflation a few weeks prior to the IBM announcement.

Amdahl Corp., maker of plug-compatible IBM systems, announced a similar price increase May 1. Prime Computer, Inc., Control Data Corp. and Digital Equipment Corp. have also announced price increases in recent months.

Other firms such as Univac and National Advanced Systems Corp. (Nasco) are taking IBM's recent announcement to heart

and are seriously discussing price increases.

Additional firms contacted were less committal on IBM's increases, saying that prices are constantly being evaluated and could be increased at any time.

New Strategy?

Although some sources contended IBM's second price increase within six months is an indication of a new business strategy — namely, to hike prices on a regular basis — most IBM watchers disagreed, saying the increases are in reaction to "exceptional conditions" in the information processing industry.

Spiraling inflation coupled with a severe component (semiconductor) shortage forced IBM as well as other vendors simply to spend more to build computers.

In spite of all indications suggesting...
(Continued on Page 66)

While NCR's, Burroughs' Dive

IBM Second-Quarter Earnings Rally

The mainframers have begun to issue second-quarter results and, while IBM's earnings rallied, showing a 14.4% increase from the same period last year, NCR Corp. reported a 4% decline in earnings.

Burroughs Corp.'s earnings dived 12%, the first quarterly decline for the Detroit mainframer in 17 years.

Breaking its string of four consecutive quarterly pretax margin declines, IBM posted second-quarter earnings of \$763.8 million or \$1.31 per share, compared with earnings of \$667.4 million or \$1.15 per share in the like quarter a year ago. The pretax margin for the quarter showed an 8.6% gain.

The giant's revenues advanced 15.4%, grossing \$6.2 billion, up from the \$5.4 billion in revenues in the same quarter a year ago.

First Half

For the first half, IBM's revenues topped \$11.9 billion, a 12% increase from the \$10.7 billion during the first half of 1979.

Earnings for the first two quarters were \$1.44 billion or \$2.48 per share, an 8.3% advance from the \$1.3 billion or \$2.29 per share earned in last year's first half.

Commenting on the results, IBM Chairman Frank Cary said,

"Purchases of data processing equipment in recent months have been substantially higher than the corresponding months of last year and for the six months increased at approximately the same rate as total gross income."

For the second quarter, pur-

chases of equipment showed a 16.9% increase from the same quarter a year ago, yielding a 10.6% growth in overall outright sales for the year to date. While the growth in rentals and services revenue was 14.5% for the third
(Continued on Page 64)

Western Union Overcharges Alleged

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — Western Union Telegraph Co. should be required to pay an estimated \$12 million to \$15 million to its Telex/TWX customers — that's the amount of overcharges embedded in tariffs filed by the company in 1977 and 1978, the U.S. international record carriers (IRC) charged in a recent statement to a Federal Communications Commission (FCC) administrative law judge.

The FCC has allowed the tariffs to become effective, but on a conditional basis. The need for adjustments, including refunds, will be considered by the commissioners after the FCC administrative law judge has decided whether the rates are equitable. That decision is likely around the end of this year.

The recent IRC statement, which was submitted to the

judge, sums up the carriers' objections. Statements were also filed by a "separated" FCC trial staff, representing the public in the proceeding, and by Western Union.

Opponents alleged that the economic data Western Union used

to support the increases was incomplete and unreliable.

Western Union said it would be "unfair" for the FCC to refuse to accept the cost studies "when it has recently refused to investigate the international carriers' excessive telex rates."

Symbolic vs. IBM Continues Software Pricing Debate

By Connie Winkler

CW Staff

SAN FRANCISCO — A 10-year-old antitrust suit against IBM that goes to the question of how IBM prices its software has been thrown back to the U.S. district court here for additional proceedings.

In the case, Symbolic Control, Inc. vs. IBM, Symbolic claimed IBM's free distribution of numerical control software — after

IBM unbundled software in 1969 — was predatory pricing to monopolize the software market. Symbolic was formed in 1969 specifically to market a refined automatically programmed tool (APT) program called APT/70.

The U.S. Court of Appeals for the Ninth Circuit ruled earlier this month that the district court — which had dismissed the case after Symbolic presented its testi-
(Continued on Page 65)

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COMPUTER INDUSTRY

GE to Provide Service For ECS Gear

SAN JOSE, Calif. — ECS Microsystems has concluded a service and maintenance agreement and a long-term sales arrangement with General Electric Co.'s Instrumentation and Communication Equipment Service of Schenectady, N.Y.

ECS, which recently moved its headquarters here from Australia [CW, Dec. 10], will supply its ECS 4000 intelligent emulation terminals and its ECS 4500 microcomputer system to GE. GE, in turn, will add these products to those it leases and services throughout the U.S. Currently GE leases modems, multiplexers and terminals.

Deliveries of products from ECS

to GE will begin in July, according to Dan Seale, ECS vice-president of marketing. ECS said it will supply units equipped to handle protocols used by the major mainframers and that other mainframe communications capabilities would be added at some later date.

As for service, Seale said under the agreement with GE technicians in more than 90 U.S. locations would provide both on-site and depot maintenance and services to ECS customers, whether they lease from GE or purchase from ECS.

ECS will continue to sell its products to end users and maintain its own service force.

GEC, Fairchild Halt Plans For MOS Joint Venture

MOUNTAIN VIEW, Calif. — Fairchild Camera and Instrument Corp. here and General Electric Co. Ltd. (GEC) have agreed to terminate a joint venture which would have produced 16K MOS random-access memory (RAM) devices at a plant in Neston, England.

Although the two firms declined comment on the reason for ending the venture, the French Schlumberger conglomerate, which acquired Fairchild last year, reportedly wanted no part of the deal.

The GEC-Fairchild Ltd. venture was initially capitalized for nearly \$39 million, shared equally by the two firms. The Neston plant was expected to be

in full-volume operation by 1982. Its output was to be sold primarily in Europe, where both firms have well-established marketing operations.

While the venture was originally slated to concentrate on 16K dynamic MOS RAMs, the firm was expected to branch into production of 64K dynamic RAMs and 8-bit microprocessor units.

GEC is said to have entered into the project because it doubted it could obtain an adequate supply of memory products. It has arranged to acquire Fairchild's interest in the Neston plant. Financial details were not revealed.

Tymshare to Help Boost The Source

McLEAN, Va. — Source Telecomputing Corp. and Tymshare, Inc. have entered into a development and pilot operation agreement under which Tymshare will provide services to increase the user capacity and technology of Source Telecomputing's The Source consumer information network.

Tymshare will reportedly use its experience in developing distributed multiple data bases and operating more than 50 mainframes as a computer services company to help Source Telecomputing increase the benefits provided to present users of The Source. Tymshare's Tymnet, Inc. subsidiary, which operates the Tymnet public packet communications network serving 200 cities, will also be involved in The Source expansion program, a spokesman said.

Source Telecomputing will continue to work with Dialcom, Inc., its present computer facilities operator, and service users over Telenet, a communications network operated by GTE Telenet Communications Corp. Dialcom will work closely with Tymshare throughout the expansion program.

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In Recognition of Parent Firm

Melcom Now Called Mitsubishi Electronics

By Marcia Blumenthal
CW Staff

COMPTON, Calif. — Melcom Business Systems, Inc. has changed its name to Mitsubishi Electronics America, Inc. (MEA) because of the growing recognition of the name of its Japanese parent firm, Mitsubishi Electric Corp.

Under the former Melcom name, the huge Japanese firm distributed its 8000 series of small business systems in the U.S. In addition to these systems, MEA has a semiconductor division and sells, on an OEM basis, a high-resolution color CRT terminal and communications gear, according to MEA President Akira Takei. IBM is one of the company's primary customers for the color CRT terminal.

Currently the 8000 series consists of three models ranging in main memory size from 48K bytes to 400K bytes and is priced between \$20,000 and \$400,000. These systems are distrib-

uted primarily on the West Coast through eight dealers.

While MEA intends to expand both its geographic distribution in the U.S. and its product line, Takei said the firm does not intend to market its large-scale IBM-compatible system, now under development in Japan. "It is not profitable here, but is in Japan," Takei said.

About 70% of the firm's systems are sold through distributors, with the remainder sold directly to the end user by the firm's own sales force.

MEA also produces 64K dynamic random-access memory chips. At the present time, these are available in sample quantities only, but by 1981

will be available in production quantities, Takei noted.

Although they are produced in Japan, the final testing and quality control of these semiconductor products is done at the firm's plant in Sunnyvale, Calif.

Hitachi Plans

While MEA made the decision to trade on the Mitsubishi name, another well-known Japanese computer maker, Hitachi Ltd., also announced plans recently to sell a variety of computer products under its own name in the U.S.

Currently Hitachi sells its products through National Advanced Systems

Corp. (Nasco), a unit of National Semiconductor Corp. that acquired the Intel Corp. computer line. However, the company said it is considering setting up its own marketing and sales organization in the U.S.

But Hitachi does not plan to discontinue its relationship with Nasco, according to Yasuo Miyauchi, Hitachi executive managing director.

"It should be remembered that it is not Hitachi's policy to meet IBM's challenge simply as a CPU maker. Rather, we are putting more effort into promoting the sale of systems using our own product strategy and software development system," he recently told a group of security analysts in Boston.

Wavetek Divests DP Interests

SAN DIEGO — With the sale of its Data Communications Division to Infolink Corp. and its Compata Division to Recognition Equipment, Inc., Wavetek Data Communications, Inc. has divested all its computer interests in favor of a stronger emphasis on the test and measurement (T&M) equipment market.

"We're not a computer company," Wavetek Vice-President John Schweikart said of the divestiture decisions. "The T&M market has really taken off in the past 10 years and data communications just hasn't kept up."

The Data Communications Division was acquired in 1970, when Wavetek felt compelled to follow the trend toward diversification, Schweikart explained. At the time, Wavetek did not anticipate the upcoming rapid growth in T&M.

Because of its strong T&M orientation, the company's sales force "can't sell" the Data Communications products, which consist of computer-based voice response systems, the vice-president said.

The Compata Division's emphasis on communications applications and operating systems presented similar problems for the sales force.

Filling the void created by the two divestments was the acquisition of Rockland Systems Corp., a high-technology instrument manufacturer, in May. Wavetek is "actively looking" to acquire more T&M companies, according to Schweikart.

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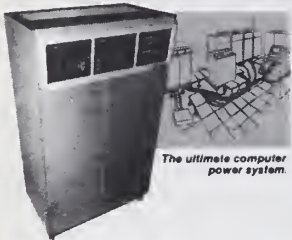
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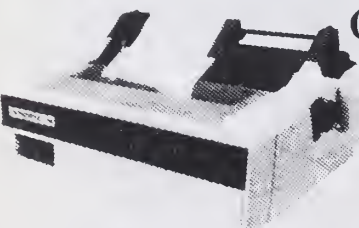


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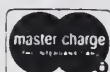
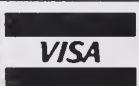


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Developing Nations' Efforts To Curb Multinational Firms Viewed Threat to Advances

By Jake Kirchner

CW Washington Bureau

ROME — Attempts by developing countries to curb the influence of multinational information companies may be biting the hand that feeds them, an international data flow conference was warned.

As the World Conference on Transborder Data Flow Policies wound down here recently, a U.S. Commerce Department official noted most of the advances in information and telecommunications technology have come from the private sector, driven by the profit motive.

The extent to which technology is made available to developing countries by the private sector is dependent on the opportunity to realize some profit. This is "one of the basic rules of commerce and cannot be abrogated," William Fishman of Commerce's National Telecommunications and Information Administration (NTIA), said here.

Fishman's comments were a reminder of the source of most information products to the delegates of 60 nations, many of them from the Third World, who had voiced concerns about the implications of their dependence on the technology of developed countries [CW, June 30].

The "facilities and capabilities" of multinational corporations will not be available to the world's emerging information economies unless the companies are given a "fair and decent opportunity to earn a profit on [their] activities," Fishman remarked.

Developed vs. Developing

The Commerce official's statement pointed to the political and economic differences that separate the developed and developing nations. In many Third World countries, the information sector is closely regulated, if not controlled, by the central government; whereas in nations such as the U.S., information services are provided through free enterprise.

As a representative of Control Data Corp. told the conference, the U.S., for all its reliance on sophisticated information systems and technology, does

not have an "information plan" like those the developing nations are struggling to construct to order their technological development.

The diversity of the U.S. information industry makes Third World fears of domination by "a huge monolith" of multinational corporations "unfounded," said Hugh Donaghue, a CDC vice-president and, like Fishman, a member of the U.S. delegation to the conference.

Concerns of other countries' delegates, however, were not so readily assuaged, as shown by the comments of a Bolivian delegate who said he did not "share the very optimistic statements" of Donaghue and representatives of other multinational corporations.

It is unsettling that "even a very powerful country" should not have a well-thought-out policy on information, which is "an enormous strength whose capability goes beyond our imagination," the Bolivian said.

"The influence of some multinational corporations," a Cuban representative added, "is always there and is always a problem."

'North-South' Dialogue

This bit of "North-South" dialogue was as close to an open disagreement as arose during the conference, a meeting notably free of the political rhetoric that has marked many previous international conferences on information practices and policies [CW, June 23].

Which is not to say the specter of multinational corporations as, in the words of one corporate attendee, "helacious giants who live on a daily diet of developing countries," was absent from the week-long discussions.

But, as one U.S. observer noted, it has become clear to developing nations that for all their concerns about preserving cultural identity in the face of foreign information use and about developing technological independence, badly needed information services and equipment are now only obtainable through what the NTIA's Fishman termed "fair and honest and thoughtful commercial dealings."

Expansions

Harris Corp. Division Plans San Antonio Plant

SAN ANTONIO, Texas — Farinon Electric of San Carlos, Calif., a unit of Harris Corp.'s Transmission Systems Division, plans to invest approximately \$9 million over the next five years in a new manufacturing facility here.

The plan calls for the purchase of 20 acres of land in a technology park in the northern part of San Antonio and construction within 12 months of a 50,000-square-foot manufacturing plant. Two additional buildings of the same size are scheduled by 1985.

According to William E. Gibson, vice-president/general manager of Farinon Electric, about 100 jobs are being created to staff the initial plant. Employment is expected to increase to

approximately 600 by 1985.

The unit's headquarters and the majority of its employees will remain in the southern San Francisco Bay area, he added.

Farinon Electric is a producer of analog and digital microwave telecommunications systems.

Other Moves

OmniData has occupied a new 10,000-square-foot facility located at 31282 La Baya Drive, Westlake Village, Calif. 91362. This facility will house OmniData's marketing group, which is undergoing substantial growth.

Computer Sciences Corp. has begun a \$13 million construction and renovation program to expand and improve its facilities in El Segundo, Calif.

DP Dialogue

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Notes and observations from IBM
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Helping Olin Train Its Pool of Talent

"People remember what they learn under the Interactive Instructional System," says Mary DiDonato, manager, development and training for the Chemicals Group of Olin Corporation. "The effectiveness is in the exercises; the system helps identify weak areas and presents extra drill in those areas."

Olin's Chemicals Group is using the Interactive Instructional System, an IBM program product, to teach newly hired customer representatives how to enter incoming orders through online computer terminals. Jane Murphy, project training manager, directs this effort.

Customer orders for industrial, agricultural and consumer chemical products are phoned into Olin's Stamford, Connecticut, headquarters. There, customer representatives enter them into an IBM System/370 Model 158AP through online terminals. Running on the same computer, the program presents a simulation of this order entry system on which the students practice.

"This helps to overcome the psychological barrier some people have to the use of computer terminals," Murphy explains. "The result has been to make new people more effective faster."

"Previously, we gave a three-week course of conventional instruction with four to eight people in a class. It was almost a

full-time job for two of us," says Murphy. "Besides being terribly time consuming it was exhausting; I don't think we could have continued much longer. The program has reduced that load considerably."

"After some training," Murphy continues, "the student takes a quiz at the terminal. This identifies any weak areas and the program gives extra instruction on those topics. At any time the student can go back to any desired subject. We've also injected some humor into the course materials, which the students enjoy."

"Training takes much less elapsed time," says Ben Graves, manager, interactive instructional systems for the corporation, "because we are able to provide sustained practice that wouldn't be feasible in a conventional training program. The students can spend more hours at the terminal than we could give them in the classroom."

"We use it to train DP people, too. We have sequences on IBM operating systems, job control language and on TSO. With these courses in-house, people can take them at any convenient time."

Boris Sichuk, corporate director, development and training, summarizes: "The Interactive Instructional System is an outstanding method for delivering training materials in the Chemicals Group, and we are actively working to expand its use to the other groups."



Algae are cultured in the laboratory to test Olin's HTH swimming pool treatment. To train customer representatives on online order entry, Olin uses IBM's Interactive Instructional System.

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Oshkosh Truck custom designs and builds vehicles like this airport crash-fire-rescue truck. Delivery can be as quick as 100 days because CADAM helps produce error-free engineering drawings fast.

Most of the large all-wheel-drive vehicles made by Oshkosh Truck Corporation are custom engineered. Even those based on standard designs are substantially modified to meet individual customer needs.

But fast delivery of the company's vehicles for construction, crash-fire-rescue, in-transit concrete mixing and similar heavy-duty tasks is vitally important. As Ron Gehrke, manager of engineering administration points out: "Quick turnaround—sometimes in 100 to 190 days—is one of the things the customer is paying for. CADAM has drastically cut both the manhours and the elapsed time required to produce the engineering drawings."

The Computer-Graphics Augmented Design and Manufacturing (CADAM®) system runs on an IBM System/370 Model 135 at the company's Oshkosh, Wisconsin, headquarters. In the fabrication of sheet metal parts, Gehrke explains, CADAM has eliminated engineering drawings as a source of error.

Often, the metal stock that must be bent into complex curves is a half-inch thick. Today, to calculate the geometry of the flat equivalent of these parts and draft the patterns by which the stock will be cut, Oshkosh Truck uses CADAM.

"Since we installed CADAM, we have yet to see one drawing come back with

errors," Gehrke says. "Because these parts are so complex, we were eating a lot of scrap costs even though we were double-checking. Frequently, we resorted to welding two simpler pieces—which is costly, but cheaper than making scrap."

On the average, he reports, there is a four to one saving of manhours on detail drawings. "The saving in elapsed time is even greater, because CADAM enables us to add late shifts. Many designers prefer the late hours, because they can get easier access to CADAM."

"We see the strongest gains when we are revising a drawing. The designer calls it up on the screen of an IBM 3251 Graphic Display Station and modifies it with a light pen. Once when a customer wanted the fuel tank moved back 12 inches, the designer changed the assembly drawing in five minutes. In general, on engineering changes our manhour gains are 12 to one."

Oshkosh Truck will sometimes "stretch" a vehicle by increasing the frame length, Gehrke notes. Previously, the draftsman changed the dimensions noted on the drawing, without changing the drawing itself. The resulting out-of-scale layout opened the possibility of errors; with CADAM, the line work is as easily stretched as the dimensions.

*CADAM is a registered trademark of the Lockheed Corporation.

IBM Earnings for Second Quarter Jump 14.4%

(Continued from Page 59)

quarter, for the year to date the growth in this category is 12.9%, exceeding those of outright sales.

Cary attributed the earnings increase for the quarter primarily to increased purchase activities. However, he warned that the effects of inflation and the costs related to

the buildup of resources continue to inhibit growth. He also noted that incoming orders for data processing equipment "continue to reflect a small increase over last year's rate."

Burroughs Earnings

From Detroit, Burroughs reported earnings for the quar-

ter of \$60.9 million or \$1.47 per share, compared with earnings of \$68.9 million or \$1.68 in the same period a year ago.

Revenues for the quarter climbed 7% to \$735.2 million, up from revenues of \$688.5 million in the second quarter of 1979.

For its first half, Burroughs

reported earnings of \$108.5 million or \$2.63 per share, down about 2.5% from the \$111 million or \$2.71 for the first half of 1979. Revenues increased 10% to \$1.4 billion, up from \$1.3 billion in the first two quarters of last year.

The company said net earnings were impacted during the quarter by a slower than expected rate of shipments, a move towards lease installations, a strike at the company's Detroit-area plants and the general bite of inflation on labor and material costs. Despite the poor earnings performance in the second quarter, Burroughs said it anticipated earnings for the year would exceed 1979's results.

NCR Figures

From NCR, earnings for the second quarter were \$56.7 million or \$2.12 per share, down from \$58.9 million or \$2.23 per share in the same quarter a year ago.

Revenues, meanwhile, advanced 10% to \$778.2 million from \$717.6 million a year

ago. Revenues for the six-month period were \$1.4 billion, an 11% increase from revenues of \$1.3 billion for the first two quarters of last year.

Earnings for the first half were \$82.2 million or \$3.08 per share, dipping 8% from the earnings of \$89 million or \$3.35 per share in the first half of 1979.

NCR Chairman William S. Anderson said the firm had been able to increase its output of several of the products that had experienced shortfalls in the first quarter. This should benefit earnings during the remainder of the year, he said.

He also said the firm had launched a number of cost-cutting programs, but "we are continuing to expand our 1980 research and development and capital expenditures programs." R&D expenditures for the company are expected to be 15% above last year's levels.

Anderson reported that incoming orders from overseas markets more than offset a decline in U.S. orders.

Nickels & Dimes

Ampex Corp. has increased the quarterly dividend from five cents to six cents, payable July 25 to shareholders of record July 9.

\$ \$ \$

A two-for-one stock split was approved by holders of Tandem Computers, Inc. common stock, effective June 30.

\$ \$ \$

Logicon, Inc.'s board of directors declared a semiannual cash dividend on its common stock of 10 cents per share.

National Data Corp. announced that its board of directors has approved an increase in its regular quarterly dividend to 10 cents per share, an increase of 43% over the prevailing rate.

\$ \$ \$

Control Data Corp. has declared a regular quarterly dividend of 15 cents per common share, payable Oct. 1, to shareholders of record on Sept. 15. The board also declared a quarterly dividend of \$1.125 per share on the

company's preferred stock, payable on Sept. 30, to shareholders of record on Sept. 2.

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Computer Consoles, Inc. has concluded an agreement with its banks increasing its lease line to \$60,000,000.

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Emulex Corp. has negotiated its first bank credit line. The agreement with Imperial Bank of California makes available more than \$1 million.

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Tied to Lease Sale Decisions

Northern Telecom Earnings Drop

MONTREAL — Northern Telecom Ltd. anticipates that its second-quarter and full fiscal 1980 operating earnings will be substantially below 1979 levels. The firm earned nearly \$2 billion last year.

Although the company declined to give any specific details on its earnings, which will be announced this week, a spokesman said a large portion of the poor performance is the result of its U.S. subsidiary's decision not to sell off its leases to third parties during the second quarter.

By selling these leases at a discounted rate, Northern Telecom Systems Corp. (NTSC) was able to realize revenues and earnings immediately, but sacrificed long-term financial gains resulting from holding these leases. Only limited third-party lease sales will be made in the future, the firm said.

This decision also means the corporation's financial results will continue to be impacted

by financing and interest expenses necessary to support the growing lease base of customers. Like other vendors, NTSC has had an increased demand for leases in the past year.

In addition, the firm said earnings were impacted by the activities related to consolidating its Data 100 and Sycor acquisitions into NTSC. During the past 18 months, the company has been combining the products of activities of both acquisitions.

Personnel Turmoil

NTSC dropped all of Data 100's OEM business and has cross-trained both companies' sales and service personnel, the spokesman noted. Presently NTSC has a U.S. sales force of 220 people and a service organization of 1,200 persons located in 135 offices.

The consolidation took longer than expected and was more expensive than anticipated because of the turmoil

created by personnel turnover among the executives in the acquired companies.

Both firms were young and had entrepreneurial types of management, who found it hard to fit into the parent company, the spokesman noted. However, he claimed the reorganizations have had little effect on users of the Sycor and Data 100 products.

A third factor causing diminished earnings is the high start-up costs for NTSC's large-scale DMS-100 digital switching system.

A primary future direction for Northern Telecom includes actively pursuing the office systems market, enhancing its current products to fit that market as well as developing new ones in conjunction with its subsidiary, Bell Northern Research Ltd.

Symbolic vs. IBM Returns To Software Pricing Issue

(Continued from Page 59)
mony in one part, injury — had to consider "further proceedings not inconsistent with this opinion."

Bifurcated Trial

District Court Judge Alfonso Zirpoli had ordered a two-part — bifurcated — trial. The first part, on impact, was heard in early 1975. After Symbolic's case, Zirpoli granted IBM's motion to dismiss the case.

The appellate court, in a complicated 11-page decision, found fault with the way Zirpoli bifurcated the trial — under his ruling, the liability or showing of violation was to follow the impact determination.

"The court assumed a violation had occurred, but found that it did not cause the losses sustained by Symbolic. Yet if the assumed violation consists of IBM's giving away a discrete product line in order to bar a potential entrant from competing with the line, it is difficult to assume anything but adverse competitive effects," the appeals court said.

An IBM spokesman said the company is studying the decision. It has been represented on the case by the San Francisco firm of Pillsbury, Madison & Sutro.

Symbolic's lawyer, John H. Boone, who has the case on a contingency basis, said he is waiting to see what IBM and the court decides to do. If there is a new trial, he will ask for a jury. A jury trial was rejected in 1975 because documents in the case related both

to injury and liability, the issues the judge bifurcated.

Symbolic, in its trial papers, said damages included \$1.2 million, which investors put up to start the new company. Those damages were subsequently estimated through 1978 to be \$63 million, said Arthur Pfeiffer, president of the company which for all real purposes went out of business in 1971 when it could not market its product.

APT History

APT was developed by the Massachusetts Institute of Technology (MIT) in the 1950s to design parts, primarily for the auto and aerospace industries. It encompassed as much as 350,000 lines of code, said Pfeiffer, who worked with APT at the Illinois Institute of Technology which took it over from MIT.

APT's successors today are computer-aided manufacturing (CAM) and computer-aided design (CAD) programs.

APT was made available to all computer manufacturers in the mid-1960s, and in 1967 IBM announced its first version, NC/360, Pfeiffer recalled. Symbolic principals felt they had an improved version and began field tests in 1971. Symbolic never won a customer.

IBM did not start charging for the software until 1973, Pfeiffer said. "People don't see any reason to question when it's free, but giving it away is the most extreme form of predatory pricing."

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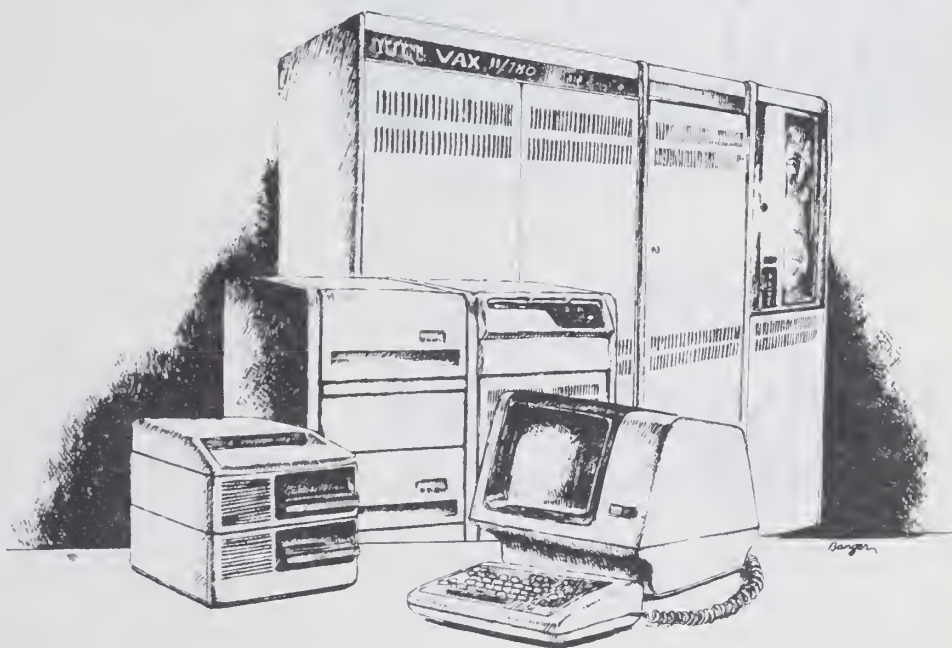
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IBM Price Hike Ripples May Be Start of Wave

(Continued from Page 59) gesting that inflation will be with us for some time, William Easterbrook, vice-president at Kidder Peabody & Co. in New York, said the rapid-fire price hikes will probably level off in the next couple of years.

In addition, IBM will probably turn away from massive

price hikes such as that recently announced toward more selective "tweaking" of specific products connected with specific product lines, according to John Rhefield, vice-president of Pacific operations at IDC.

Both analysts agreed IBM's move was an effort to boost its

earnings in the third and fourth quarters. And both analysts agreed the move will probably work.

How much the price increase will boost earnings is open to debate. While most analysts agreed on the 7% to 10% range, Easterbrook said he expects IBM to experience a 13% earnings increase.

Clear Shove

IBM's somewhat selective increases in its less than profitable areas constitute a "clear economic shove," Tom Crotty, analyst for the Gartner Group, said.

IBM has made it no secret in the past that it prefers to have its customers purchase hardware rather than lease or rent. The recent price increase further drives home that point because purchase prices on most major equipment were unchanged by the announcement.

The best example of IBM's philosophy, Crotty said, is its 30 series, a line of CPUs quickly coming to the end of its life cycle in the shadow of the long-rumored H series. IBM announced the price increases just at the time when most 30 series CPU leases were coming due.

By raising the rent and lease price and dangling the carrot of expected late-third-quarter purchase cuts on that line, IBM is making it clear it does not want to have to take any leased systems back, Crotty said.

However, there is some good news for 30 series users. The recent price hikes will probably be the last for that line, according to Rhefield. He added that the smaller 4300 line — with which IBM set a precedent by boosting prices less than a year after that system had been introduced — will probably experience at least one more increase.

Just how many other vendors will jump at the chance to get under IBM's price umbrella is still uncertain. Rhefield said the wave of price hikes may be light and will probably be led by the plug-compatible manufacturers Amdahl and Nasco.

Easterbrook, on the other hand, believed most vendors will hop on the price-increase

wagon, but the trend will be short-lived. Prices are expected to remain inflated in the early part of the decade, and then drop off towards mid-decade.

Shugart, Tandon Conclude Drive License Agreement

SUNNYVALE, Calif. — Shugart Associates here and Tandon Magnetics Corp. of Chatsworth, Calif., have concluded an agreement that provides a nonexclusive license to Shugart for use in its Bi-compliant floppy disk drives.

Under the terms of the agreement, Shugart will pay Tandon an undisclosed sum of money for the patent plus offer Tandon nonexclusive rights to two Shugart patents.

The licensing arrangement resolves the six-month dispute between the two firms concerning the head design for double-headed floppies. Tandon, which holds a general patent for a double-sided head, claimed Shugart had copied its design.

Shugart, which holds patents on other devices, claimed it had not copied Tandon's design. There was no litigation surrounding the controversy.

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Acquisitions

Sun Information Services Co. has acquired NMF, Inc., a privately held trust data services company based in Charlotte, N.C. The acquisition is a cash-for-stock transaction.

Information Development and Applications, Inc. has purchased Kee, Inc. of Seminole, Fla.

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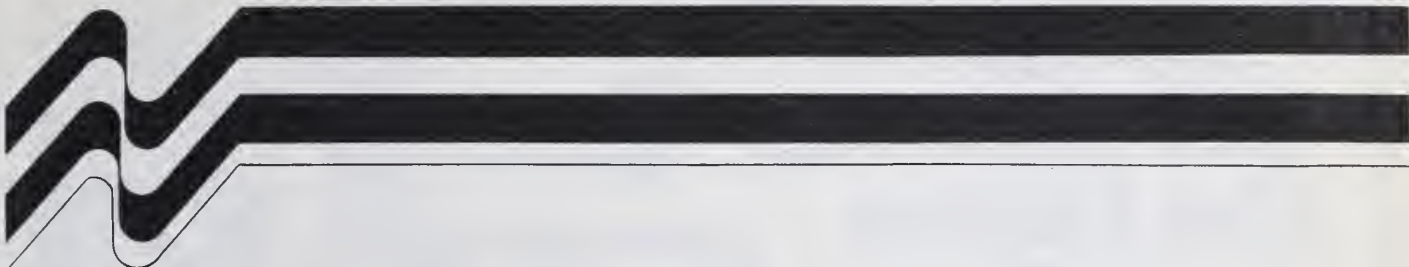
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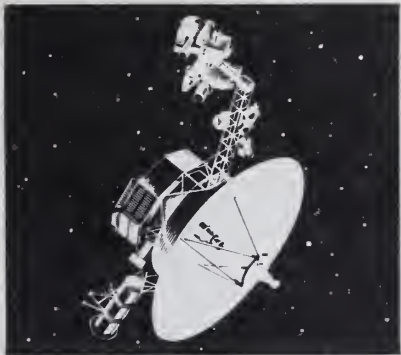
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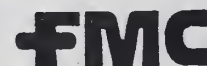
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Includes 23 New Categories

The 1980 Survey has been expanded to provide specific data for 23 new categories. These include positions in data communications, mini/micro programming, data base administration, technical marketing support and EDP auditing in addition to our traditional categories of programming, software, systems design, management and computer marketing.

Do you know how your salary compares with other EDP professionals in your specialty—with the same level of experience—working in your city, or in other cities across North America? Are you being well paid for what you do? Are salaries better elsewhere?

Now you can find out simply by calling today and asking for a copy of our current 1980 Local Metropolitan Computer Salary Survey. It's FREE!

Source Edp, North America's largest recruiting firm specializing in the computer field, publishes this valuable Survey annually as a service to computer professionals from coast to coast. The 1980 Survey shows current salaries in your area, 37 other areas in the U.S. and Canada, plus overall national averages. Salaries are shown by career specialty broken down by length of experience or size of computer system.

As you will discover, this Survey can be extremely valuable in helping you make important career decisions. Call for your free copy today.

For your free report, simply phone the Source Edp office nearest you.

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(When writing, please be sure to indicate home address and position title).
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You will assist in the installation of a new life insurance processing system or assist in the design of a corporate MIS data base system. You should understand large integrated data base systems, on-line systems, and modular programming techniques. 2-6 years of experience with ALC and/or COBOL is required. OS knowledge and insurance knowledge is preferred.

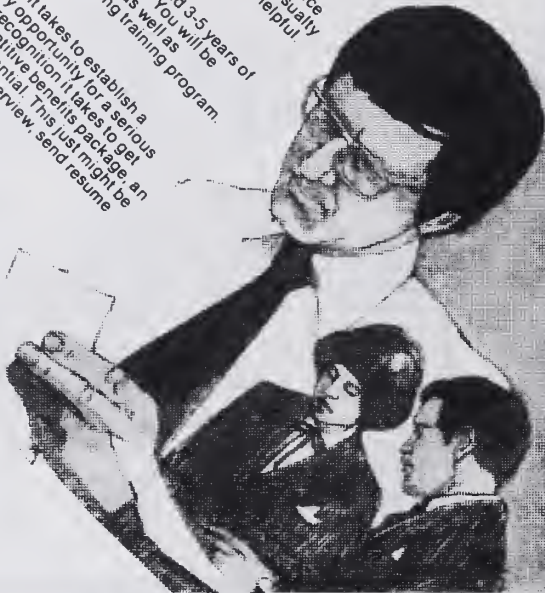
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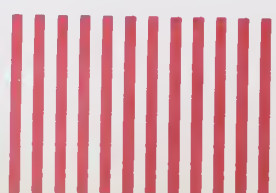
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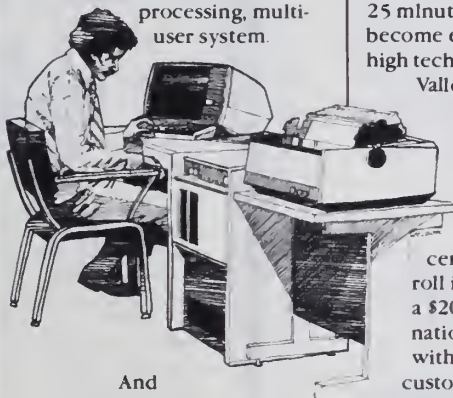
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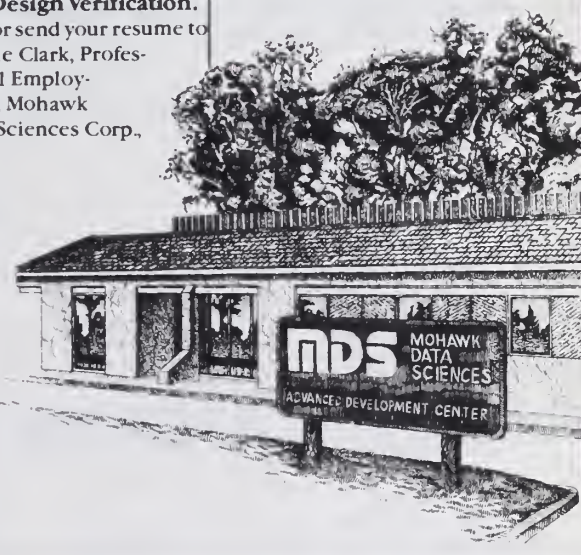
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With a minimum of supervision, you will be responsible for performing system or hardware analysis, design, studies (including trade studies), planning, costing and specification tasks for a large scale, integrated range control system to be used in the testing of weapons systems. Requires some past experience in specifying and designing interfaces between TM and various sensors, displays, communications equipments, and ADPE components as well as some background in the analysis and/or design of these same equipments.

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CSC

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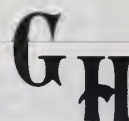
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For more details, send your resume, or call:



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The incumbent should have a degree in mining engineering, geophysics, computer science or related field and a minimum of four years experience in FORTRAN programming. Mine simulation or exploration systems experience preferred.

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A degree in business administration, math or computer science and four years of COBOL programming experience is required. In addition, experience in FORTRAN programming, system 2000 database, interactive graphics software and financial modeling systems is highly desired.

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A degree with computer courses and two years of timesharing or wordprocessing experience is required. The incumbent will provide timesharing customer support on telephone, train users, write/type user manuals and administer userids, manuals, terminals, budgets, etc.

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Minimum five years experience in analysis and COBOL programming. Burroughs systems experience preferred. Strong verbal and written communications skills a must. Exposure to engineering/maintenance systems a plus.

In addition to competitive salary, we provide excellent benefits including tuition reimbursement, dental insurance and stock plan. Send your resume to:

Employee Relations Dept.
Old Ben Coal Company
A Division of the Standard Oil of Ohio Company
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Chicago, Illinois 60606

ASSISTANT DIRECTOR OF MANAGEMENT INFORMATION SERVICES

Starting Salary \$32,390
Or Commensurate with Experience

Responsible for assisting the Director in the implementation of the plans, policies and procedures of the Office of Management Information Services including the planning, budgeting, training and scheduling and supervision of certain staff functions. Bachelor's Degree in Computer Science or related fields with considerable experience in the programming of large scale computers, including systems analysis experience in commercial or engineering applications. Previous pertinent supervisory experience is required.

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Starting Salary \$28,800
Or Commensurate with Experience

Qualified individual to be responsible for system feasibility studies and surveys, design and development of system specifications, programming, testing, implementation and maintenance of data processing system applications. Degree in Computer Science or related fields. Extensive applicable and responsible experience in Systems Development and Programming on medium to large scale capacity computers in a multi-programming or data base environment with several years in a supervisory capacity required.

APPLY TO:

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John H. Smith
Assistant to the President
Oregon Institute of Technology
Oretech Branch Post Office
Klamath Falls, OR 97601
(502) 882-8321, ext. 282

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The Director will report to the President of the corporation and will have responsibility for a large budget, software/hardware technology and evaluation; and organization, supervision and administration of the entire Systems and Programming function. Individual must have a B.S. (M.B.A. preferred), a minimum of 10 years MIS experience including 4 as a Manager, and heavy exposure to the development of banking and financial systems. The Director will have constant interface with the Board of Directors of the corporation. Compensation \$40,000+ outstanding bank benefit package.

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Grumman Data Systems, a subsidiary of Grumman Corporation is expanding its operations, necessitating the immediate hiring of Senior Marketing Representatives.

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- Automated Test Systems
- Signal Processing
- Contract Software and Systems
- Energy Data Systems

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Jerry Anderson or
Bob Couch
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MANAGER OF SYSTEMS DEVELOPMENT

Our client is searching for a Data Processing Executive with demonstrated ability to manage upward of 20-25 professionals. The position reports to the Director of MIS. The ideal candidate should be well versed in the following technologies and theories:

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- Teleprocessing
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SR. ELECTRONIC ENGINEER

Participates in the specification of system architecture and translation of requirements into hardware specs, as well as analyzes and proposes hardware/software design approaches for control unit for an intelligent data storage device. BS/MS in EE or Computer Science is desired, coupled with 5-10 years experience in logic and system design. Should also be experienced in design and development of storage control unit for IBM-compatible peripheral storage systems.

SR. SYSTEM PROGRAMMER

Will plan, design and implement a new line of peripheral data storage systems to IBM 43XX series computer and performance monitoring. An in-depth understanding of IBM OS/VS2, DOS/VS and VM operating systems, as well as a data base concept and related access methods is needed, plus exposure to assembly language, SAM, DAM, ISAM, and VSAM. Requires 5-10 years experience in operating systems and I/O driver development.

SR. ENGINEERING PROGRAMMER

Will participate in the specification of system architecture and translation of requirements into software/firmware specifications, definition of control language, design and development of software/firmware and microcode for large data storage devices/controllers based on state-of-the-art microprocessors. Requires 3-5 years experience in control hardware, as well as knowledge of the software development process. BS, MS in Electrical Engineering or Computer Science.

We offer competitive salaries, complemented by a full range of employee benefits, including relocation assistance and a company-subsidized car pool program. These positions offer excellent potential for career development with our growing organization in sunny Southern California. For immediate consideration, please send resume including salary history to: Employee Relations, EXXON ENTERPRISES INC., 3100 E. Foothill Blvd., Pasadena, CA 91107.

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THE POSITION: The Director has responsibility for design, development, and operation of information systems and directs a staff of about 100 technical, operations, and management personnel. The Director reports to the Assoc. V.P. for M.I.S.

THE REQUIREMENTS: The Director must be an experienced manager. Sharp interpersonal skills are key to dealing with all levels of University personnel. Experience in all facets of information systems work is necessary, an MBA desirable.

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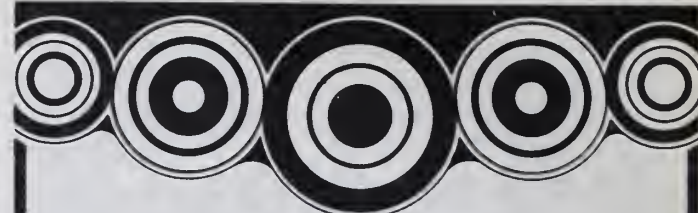
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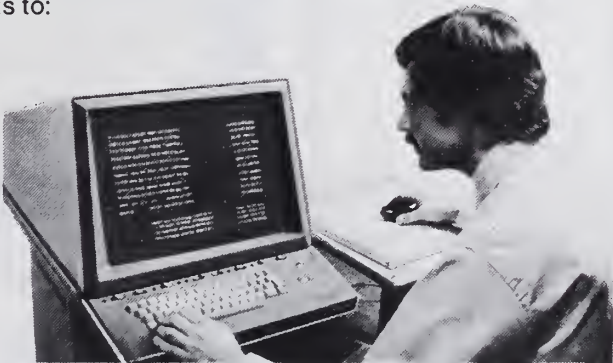
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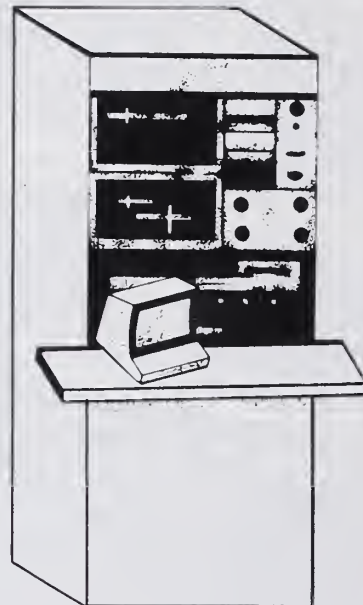
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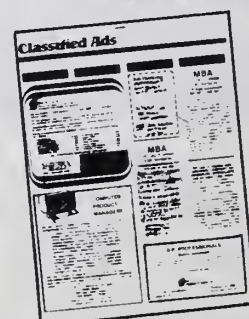
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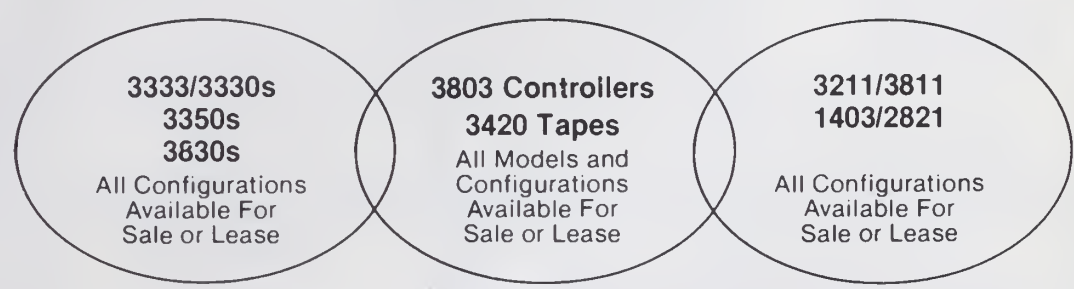
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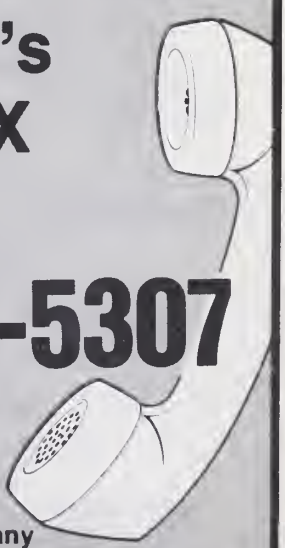
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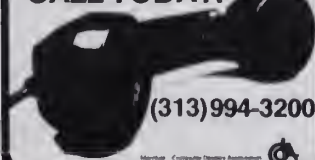
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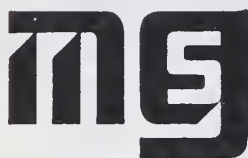
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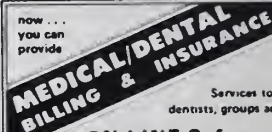
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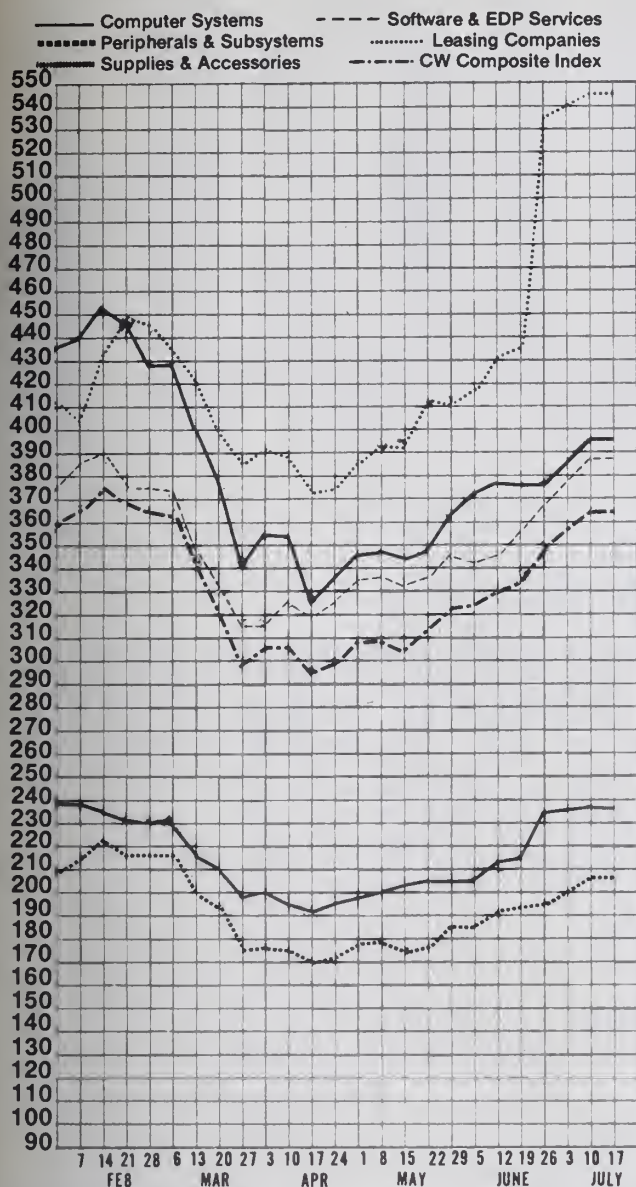
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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JULY 9, 1980

E X C H		PRICE			
		1979-80	CLOSE	WEEK	WEEK
		RANGE	JUL 9	NET	PCT
		(1)	1980	CHNGE	CHNGE
COMPUTER SYSTEMS					
A	AMOHL CORP	15- 42	22 3/4	+3 7/8	+20.5
N	BURROUGHS CORP	60- 88	66	-1 7/8	-2.7
D	COMPUTER AUTOMATION	9- 22	16 3/4	+1 1/4	+1.5
N	CONTROL DATA CORP	35- 63	59 7/8	+4 5/8	+8.3
O	CRAY RESEARCH INC	30- 59	58 3/4	+8 1/2	+16.9
N	DATA GENERAL CORP	46- 75	72 1/4	+6 1/2	+9.8
N	DATAPoint CORP	44- 58	56 5/8	+3 1/8	+5.8
N	DIGITAL EQUIPMENT	52- 83	72 3/4	+4 3/4	+6.9
A	ECCO INC	9- 19	13 1/2	- 3/8	-2.7
N	ELECTRONIC ASSOC.	6- 12	8 1/8	- 1/4	-2.9
N	FOUR-PHASE SYSTEMS	20- 49	24 1/8	+3/8	+1.5
N	FOXBORO	31- 44	42 3/4	+5 3/8	+14.3
O	GENERAL AUTOMATION	7- 19	7 1/4	- 1/8	-1.6
O	GRI COMPUTER CORP	1- 3	3/8	0	0.0
N	HEWLETT-PACKARD CO	46- 71	68 1/4	+4 3/4	+7.4
N	HONEYWELL INC	65-101	83 1/8	+4 1/4	+5.3
N	IBM	50- 79	61 1/2	+1 3/4	+2.9
N	MANAGEMENT ASSIST	9- 21	14 1/2	- 3/8	-2.5
O	MANUFACTURING DATA S	22- 38	34 1/4	+1 1/4	+0.7
O	MINI-COMPUTER SYST	2- 6	2 3/4	+1/8	+4.7
O	MODULAR COMPUTER SYS	9- 17	14 3/4	- 1/8	-0.8
N	NCR	52- 82	60 3/4	+4 1/8	+7.2
N	PRIME COMPUTER INC	15- 25	25 1/8	+1 1/4	+5.2
N	PERKIN-ELMER	26- 50	49 1/2	+1 1/4	+2.5
N	SPERRY RAND	42- 60	50 3/8	+1 1/4	+2.5
A	SYSTEMS ENG. LABS	11- 22	19	+2 1/8	+12.5
O	TANDEM COMPUTERS INC	26- 63	62 3/4	+4 3/4	+8.1
N	TEXAS INSTRUMENTS	79-108	97 1/4	+2 5/8	+2.7
A	WANG LABS.	17- 40	34 7/8	+3/4	+2.1
LEASING COMPANIES					
O	BOOTHE FINANCIAL CP	13- 20	15 1/4	- 1/4	-1.6
N	COMOISCO INC	6- 17	13	+1 3/4	+15.5
A	COMMERCE GROUP CORP	1- 2	1	- 1/8	-11.1
A	COMPUTER INVSTRS GRP	2- 4	1 3/4	- 3/8	-17.6
O	CONTINENTAL INFO SYS	2- 15	1 3/4	+1/4	+16.6
M	DATRONIC RENTAL	2- 3	2 7/8	+1/4	+9.5
A	OCL INC	3- 6	3 3/8	-2 1/4	-40.0
N	OPF INC	5- 12	6 1/4	+1/8	+2.0
N	ITEL	1- 15	2 7/8	- 1/2	-14.8
O	LEASPAC CORP	1- 2	7/8	+3/8	+75.0
A	PIONEER TEX CORP	2- 4	2 1/2	- 3/8	-13.0
N	RELIANCE GROUP INC	24- 73	64 1/4	- 1/2	-0.7
N	U.S. LEASING	12- 18	15 3/4	+3/4	+5.0

E X C H		PRICE			
		1979-80 RANGE (1)	CLOSE JUL 9 1980	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 3	2 5/8	+ 1/4	+10.5
O	ANACOMP INC	7-16	15 1/4	+1/2	+3.3
O	ANALYST5 INTL CORP	3- 6	4 1/4	0	0.0
A	APPLIED DATA RES.	6-14	12 1/4	+7/8	+7.6
N	AUTOMATIC DATA PRDC	31-44	43 5/8	+5 1/8	+13.3
O	COMPUTER HORIZONS	1- 9	3 3/4	- 1/4	-6.2
O	COMPUTER NETWORK	4- 9	5 3/4	-3/8	-6.1
N	COMPUTER SCIENCES	11-24	23	+1 7/8	+8.8
O	COMPUTER TASK GROUP	1- 9	8 3/4	+3/4	+9.3
O	COMPUTER USAGE	2- 5	3 3/8	+1/8	+3.8
O	COMPUT AUTO REP SVC	4-10	4 7/8	+1/4	+5.4
O	COMSHARE	11-20	14 1/4	+2 1/4	+18.7
O	CULLINANE CORP	18-40	39	+1	+2.6
O	DATA DIMENSIONS INC	1- 6	1 1/2	+1/8	+9.0
D	DATATAB	1- 4	1 1/8	+1/8	+12.5
O	OSI CORP	4- 9	5 3/4	- 1/4	-4.1
N	ELECTRONIC DATA SYST	19-28	26 1/8	-3/8	-1.4
O	INFORMATICS INC	9-22	16 1/4	+3/4	+4.8
D	INSYTE CORP	1- 3	2	+1/4	+14.2
O	IPS COMPUTER MARKET.	2- 4	3	0	0.0
O	KEANE ASSOCIATES	3- 9	5 1/4	0	0.0
O	KEYDATA CORP	2- 5	2 1/8	+1/8	+6.2
A	LOGICON	12-23	20 3/4	-1/4	-1.1
O	MATHEMATICA INC	5-14	12 1/2	0	0.0
O	NATIONAL DATA CORP	10-20	20	+1	+5.2
N	PLANNING RESEARCH	5- 9	6	+1/4	+4.3
O	PROGRAMMING & SYS	1- 1	5/8	+1	+10.0
O	RAPIDATA INC	4- 7	5 5/8	+1	+21.6
O	REYNOLDS & REYNOLD	24-34	27 1/4	-1/2	-1.8
O	STSC INC	6-11	10 3/4	0	0.0
O	SCIENTIFIC COMPUTERS	6-17	14 1/4	-1/4	-1.7
N	TYMSHARE INC	34-58	56	+6 3/8	+12.8
A	URS SYSTEMS	5-13	13	+1 1/4	+10.6
N	WYLY CORP	4- 9	8 1/4	+5/8	+8.1

PERIPHERALS & SUBSYSTEMS

N	AM INTERNATIONAL	13-20	16 3/8	+1	+6.5
N	AMPEX CORP	14-29	21 1/4	+2 1/8	+11.1
A	ANDERSON JACOBSON	9-17	10 5/8	0	0.0
N	APPLIED OIG DATA SYS	5-10	8 1/8	+1 7/8	+30.0
O	AUTO-TROL TECHNOLOGY	18-40	32 1/4	-1/4	-0.7
O	BEEHIVE INT'L	3-8	6 1/2	0	0.0
A	BOLT, BERANEK & NEW	12-23	21 3/8	-1 1/2	-6.5
N	BUNKER-RAMO	17-32	27 1/2	+1/2	+1.8
O	CAMBRIDGE MEMORIES	1-9	1 3/8	0	0.0
N	CENTRONICS DATA COMP	20-55	41 1/8	+2 1/4	+5.7
A	CETEC CORP	3-7	5 1/2	+3/8	+7.3
O	COMPUTER DEVICES INC	5-9	6 7/8	-1 1/2	-1.7
O	COGNITRONICS	1-5	4 1/2	+7/8	+24.1
O	COMPUTER COMMUN.	4-10	4 1/8	+3/8	+10.0
O	COMPUTER CONSOLES	4-29	14 1/4	+2 1/4	+18.7
O	COMPUTER TRANSCIVER	1-5	2 5/8	+1/8	+5.0
N	COMPUTERVISION CORP	24-62	61 1/2	+5 3/4	+10.3
N	CONRAC CORP	13-25	16 7/8	-1/4	-1.4

E		PRICE				
X		1979-80	CLOSE	WEEK	WEEK	
C		RANGE	JUL 9	NET	PCT	
H		(1)	1980	CHNGE	CHNGE	
A	DATA ACCESS SYSTEMS	6- 14	12 1/4	- 1/4	-2.0	
A	DATA PRODUCTS CORP	11- 24	17 3/4	+2 1/4	+14.5	
O	DATUM INC	2- 4	1 7/8	0	0.0	
O	DECISION DATA COMPUT	2- 5	3 1/8	+ 5/8	+25.0	
O	DELTA DATA SYSTEMS	1- 3	1 1/8	+ 1/8	+12.5	
N	DUPLICATION INC	7- 27	12	-1	-7.6	
O	DATARAM CORP	6- 37	9 1/8	- 1/4	-2.6	
N	ELECTRONIC M & M	3- 6	4 3/4	+ 3/8	+8.5	
D	EVANS & SUTHERLAND	21- 38	37 1/4	+ 1/4	+0.6	
O	FABRI-TEK	1- 4	3 5/8	+1	+38.0	
O	GENERAL COMPUTER SYS	1- 3	2 7/8	+ 3/8	+15.0	
O	GENERAL DATACOM INO	12- 18	17	+1 1/2	+9.6	
O	GENERAL TERMINAL CP	1- 4	1 7/8	- 1/4	-11.7	
N	HAZELTINE CORP	12- 30	23	- 1/2	-2.1	
N	HARRIS CORP	25- 40	38	+1 1/4	+3.4	
O	INFOTEC INC	1- 8	1	+ 1/8	+14.2	
O	INFORMATION INTL INC	8- 15	11	+1 1/4	+12.8	
O	INTEL CORP	45- 75	71 3/4	+5 3/4	+8.7	
O	INTERCIL	13- 33	22 5/8	+3 1/4	+16.7	
A	LUNOY ELECTRONICS	4- 12	8 1/8	- 1/8	-1.5	
O	MSI DATA CORP	5- 11	7 1/8	+1	+16.3	
N	MEMOREX	10- 34	14 7/8	- 3/4	-4.7	
N	MOHAWK DATA SCI	10- 20	16 1/8	+1 3/8	+9.3	
O	OMEX	2- 10	7 1/2	0	0.0	
A	PARADYNE CORP	18- 35	33 1/2	+4 7/8	+17.0	
A	PENRIL CORP	9- 15	9 5/8	- 3/4	-7.2	
O	RAMTEK CORP	10- 17	11 1/4	-1 1/2	-11.7	
O	RECOGNITION EQUIP	5- 13	8	+ 1/2	+6.6	
O	SCAN DATA	1- 5	1 3/8	0	+4.5	
N	STORAGE TECHNOLOGY	12- 21	14 7/8	+ 3/8	+2.5	
O	SYKES DATA TRONICS	14- 29	27 1/2	-1	-3.5	
O	T BAR INC	14- 21	19	-1	-5.0	
A	TEC INC	3- 9	5 1/8	-1	-16.3	
N	TEKTRONIX INC	42- 64	58 1/4	+8 1/4	+16.5	
N	TELEX	3- 6	3 1/4	0	0.0	
O	TESOATA SYSTEMS CP	8- 26	8 1/4	- 3/4	-8.3	
O	TIMEPLEX INC	7- 15	14 5/8	+1 3/4	+13.5	
O	WILTEK INC	1- 2	1 7/8	0	0.0	

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

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